



**North Carolina Department of Transportation
Transportation Planning Branch**

Comprehensive Transportation Plan



Columbus County

December 2007

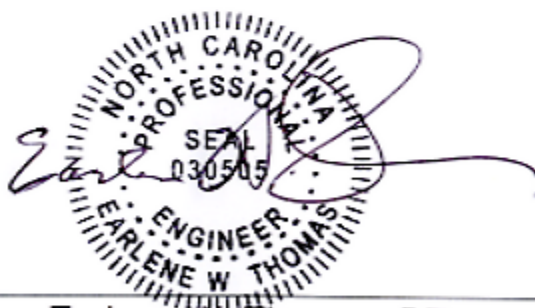
Comprehensive Transportation Plan Study Report

Columbus County

Prepared by the: Transportation Planning Branch
Division of Highways
N.C. Department of Transportation

In Cooperation with: Columbus County
Cape Fear Rural Planning Organization
The Federal Highway Administration
U.S. Department of Transportation

December 2007



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Acknowledgments

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Executive Summary

In March of 2005, the Transportation Planning Branch of the North Carolina Department of Transportation and Columbus County entered into an agreement to cooperatively develop the Columbus County Comprehensive Transportation Plan. This multi-modal transportation plan is a product of this cooperative effort.

This report documents the findings of this study, along with recommendations for improvements that were developed. In addition, this report presents cross-section recommendations, roadway conditions, land use information, and environmental features found in the study area.

The recommendations for improvements are listed below. A more detailed discussion of these recommendations can be found in Chapter 2.

- Proposed I-74

In accordance with the NCDOT Strategic Highway Corridors (SHC) Report and the R-3436 feasibility study, it is recommended that I-74 be constructed as a freeway on new location from 1.0 mile west of the US 74/76 and NC 211 intersection southeast to the Brunswick County line.

Interchanges should be constructed at the intersections of US 74 and NC 211. Grade separations should be constructed at the intersections of NC 214 and Tram Road (SR 1706).

- Proposed I-20

In accordance with the SHC Report, it is recommended that I-20 be constructed as a freeway on new location from the South Carolina State line north of US 76 to the southwestern boundary of the Chadbourn planning area.

Interchanges should be constructed at the intersection of NC 904 and Rough and Ready Road (SR 1004). Grade separations are recommended at US 76, Old Stake Road (SR 1300), and Cedar Grove Church Road (SR 1410).

- US 74

In accordance with the SHC Report, it is recommended that US 74 be upgraded to freeway standards from the Robeson County line to the Chadbourn planning area boundary. In accordance with the TIP Project R-4900, an interchange is recommended at NC 242. An interchange at Macedonia Church Road (SR 1506) is also recommended.

In accordance with the TIP Project R-4462, the recommendations are as follows: The section of roadway from Red Hill Road (SR 1700) to the western boundary of the Lake Waccamaw planning area is to be upgraded to freeway standards with an

interchange at the Hallsboro Road (SR 1001) intersection. The section of roadway from the eastern boundary of the Lake Waccamaw planning area to 0.5 miles west of the NC 11 intersection is recommended to be upgraded to freeway standards with interchanges at the proposed I-74 and NC 214. In accordance with TIP Project R-61C, and interchange is recommended at NC 211. These improvements will improve safety and increase the capacity of the roadway.

From 0.5 miles west of the NC 11 intersection, US 74 will be realigned as a freeway on new location south of the existing alignment in accordance with feasibility study FS-9903A. This facility will intersect with the existing alignment of US 74/76 in Brunswick County. This will improve safety and increase capacity of the roadway while avoiding potential impacts. Interchanges are recommended at the intersections with existing US 74/76, Livingston Chapel Road (SR 1843), Water Tank Road (SR 1824), and at the proposed extension of NC 87.

- NC 87
In accordance with the SHC Report and TIP Project R-2561, it is recommended that NC 87 be improved to expressway standards. It is also recommended to extend NC 87 on new location from existing US 74/76 to the recommended new location of US 74/76. An interchange is recommended at the intersection of NC 87 and the proposed new location of US 74/76 and a grade separation is recommended at the existing US 74/76 and NC 87 intersection. This recommendation includes upgrading NC 87 to a four lane divided facility and the implementation of access management strategies to improve safety, increase mobility and reduce congestion.
- US 74/76 Bus
It is recommended that the section of roadway from US 74 to the western boundary of the Whiteville planning area be improved to boulevard standards. The existing two and three-lane facility should be improved to a four lane divided highway with partial control of access. Improvements will increase capacity, improve safety and relieve congestion.
- US 701
It is recommended that the section of roadway from NC 131 to the northern boundary of the Whiteville planning area and the section from the southern boundary of the Whiteville planning area to the northern boundary of the Tabor City planning area be upgraded to boulevard standards. The existing two and three-lane facility should be improved to a four lane divided highway with partial control of access. Improvements will increase capacity, improve safety and relieve congestion.
- NC 130
It is recommended that NC 130 from the southern boundary of the Whiteville planning area to the Brunswick County line be upgraded to boulevard standards. The existing facility should be improved to a four-lane divided highway with partial control of access. Improvements will increase capacity, improve safety and relieve congestion.

- The following routes are recommended to be upgraded to two 12-foot lanes with 2-foot paved shoulders.

Table 1: Narrow Roads		
<u>Facility</u>	<u>From</u>	<u>To</u>
US 76	South Carolina State Line	Chadbourn planning area
NC 131	US 701	Bladen County line
NC 214	US 74/76 Bus	US 74/76
NC 410	US 701	Bladen County line
NC 904	Robeson County line	Brunswick County line
NC 905	South Carolina State Line	NC 130
Hallsboro Road (SR 1001)	NC 130	Bladen County line
Old Lumberton Road (SR 1002)	US 701	Robeson County line
Rough and Ready Road (SR 1004)	NC 904	US 701
Peacock Road (SR 1005)	NC 904	Chadbourn planning area
Old Dock Road (SR 1006)	NC 130	NC 904
Old Tram Road (SR 1159)	Poley Bridge Road (SR 1212)	Ford Road (SR 1157)
Antioch Church Road (SR 1162)	Ford Road (SR 1157)	Pleasant Plains Road (SR 1166)
Pleasant Plains Road (SR 1166)	NC 130	Whiteville planning area
Old Stake Road (SR 1300)	Tabor City planning area	Emerson Church Road (SR 1310)
Ten Mile Road (SR 1308)	Emerson Church Road (SR 1310)	Sidney Road (SR 1314)
Emerson Church Road (SR 1310)	Old Stake Road (SR 1300)	Ten Mile Road (SR 1308)
Clarendon Road (SR 1317)	Sidney Road (SR 1314)	Chadbourn planning area
Beaver Dam Road (SR 1324)	US 701	NC 410
Powell Street (SR 1407)	Main Street (SR 1408)	US 76
Main Street (SR 1408)	Powell Street (SR 1407)	Cedar Grove Church Road (SR 1410)
Cedar Grove Church Road (SR 1410)	Main Street (SR 1408)	Cerro Gordo City limits
Blackwell Road (SR 1412)	Old Stake Road (SR 1300)	Cedar Grove Church Road (SR 1410)
Lewis Road (SR 1415)	Cedar Grove Church Road (SR 1410)	Cherry Street (SR 1352)
Slippery Log Road (SR 1429)	Chadbourn planning area	Whiteville planning area

Table 1(continued): Narrow Roads		
Grist Road (SR 1443)	US 76	Braswell Road (SR 1414)
Smyrna Road (SR 1552)	Whiteville planning area	Peacock Road (SR 1005)
Klondike Road (SR 1572)	NC 410	Peacock Road (SR 1005)
Red Hill Road (SR 1700)	Bladen County line	US 74
Old Lake Road (SR 1740)	NC 87	US 74/76
Water Tank Road (SR 1824)	Livingston Chapel Road (SR 1843)	US 74/76
Livingston Chapel Road (SR 1843)	Water Tank Road (SR 1824)	US 74/76

Columbus County's Comprehensive Transportation Plan and technical report are a result of a coordinated effort between county staff and several informational meetings with the Planning Board and the citizens of Columbus County. The County Commissioners adopted the Columbus County Comprehensive Transportation Plan on January 16, 2007. The North Carolina Department of Transportation adopted the plan on May 3, 2007.

Implementation of the plan rests largely with Columbus County and its citizens. The County should work with the Cape Fear Rural Planning Organization to prioritize their transportation needs. This organization is responsible for presenting regional transportation needs to the North Carolina Department of Transportation. Transportation needs throughout the State exceed available funding; therefore, local areas should aggressively pursue funding for the projects they desire.

Adopted by:

Columbus County

Date: January 16, 2007

NCDOT

Date: May 3, 2007

Endorsed by:

Cape Fear RPO

Date: March 16, 2007

Recommended by Transportation Planning Branch

Date: April 5, 2007

NOTES:

Sheet 4: There are no existing or recommended bicycle routes in the planning area.

Format for Sheet 5 Pedestrian map is pending.

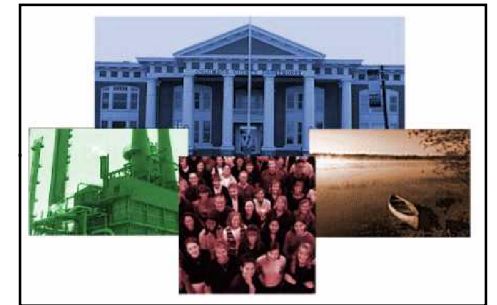
See Tabor City
Thoroughfare Plan

See
Chadbourn
Comprehensive
Transportation
Plan

See Whiteville-
Brunswick
Thoroughfare Plan

See Lake Wacammaw
Thoroughfare Plan

Lake Wacammaw



Columbus County Comprehensive Transportation Plan

Plan date: August 4, 2006

- Sheet 1 **Adoption Sheet**
- Sheet 2 **Highway Map**
- Sheet 3 **Public Transportation
and Rail Map**
- Sheet 4 **Bicycle Map**
- Sheet 5 **Pedestrian Map**

Legend

- Schools
- Roads
- Railroads
- Rivers and Streams
- Lakes
- Columbus County Line
- City Boundary
- Planning Area

0 1 2 4 6 8 Miles

Sheet 1 of 5

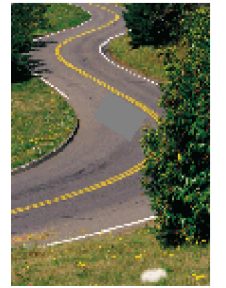
Base map date: April 29, 2005

Refer to CTP document for more details

Figure 1 - Sheet 1



Highway Map



Columbus County Comprehensive Transportation Plan

Plan date: August 4, 2006

Freeways
 Existing
 Needs Improvement
 Recommended

Expressways
 Existing
 Needs Improvement
 Recommended

Boulevards
 Existing
 Needs Improvement
 Recommended

Other Major Thoroughfares
 Existing
 Needs Improvement
 Recommended

Minor Thoroughfares
 Existing
 Needs Improvement
 Recommended

Existing Interchange
 Proposed Interchange
 Existing Grade Separation
 Proposed Grade Separation

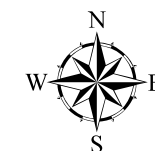
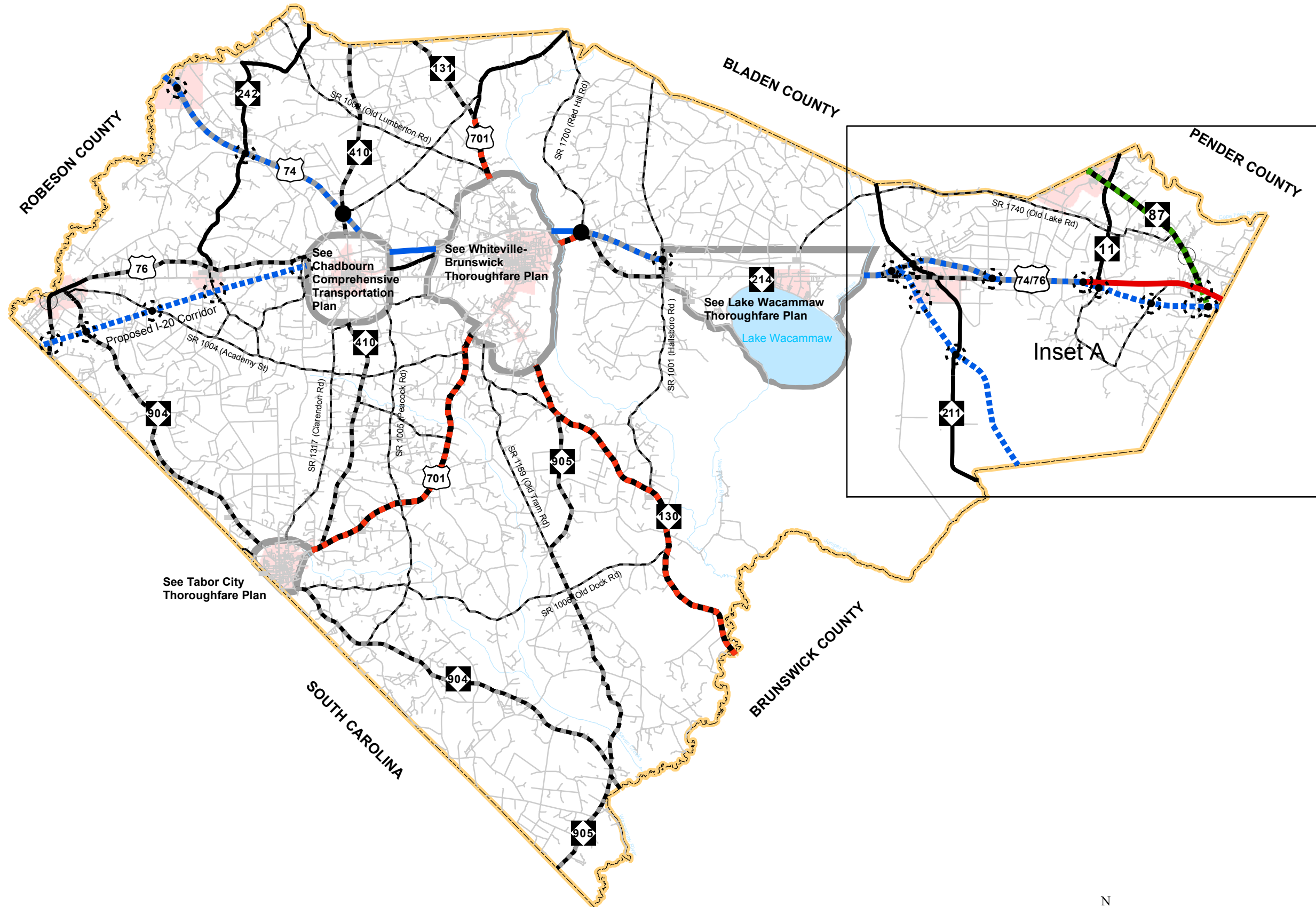
0 1 2 4 6 8 Miles

Sheet 2 of 5

Base map date: April 30, 2005

Refer to CTP document for more details

Figure 1 - Sheet 2



Highway Map
Inset A



Columbus County
Comprehensive
Transportation Plan

Plan date: August 4, 2006

- Freeways
- Existing
 - Needs Improvement
 - Recommended
- Expressways
- Existing
 - Needs Improvement
 - Recommended
- Boulevards
- Existing
 - Needs Improvement
 - Recommended
- Other Major Thoroughfares
- Existing
 - Needs Improvement
 - Recommended
- Minor Thoroughfares
- Existing
 - Needs Improvement
 - Recommended

- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation

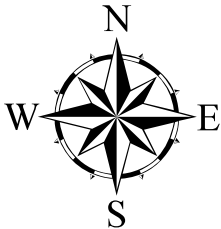
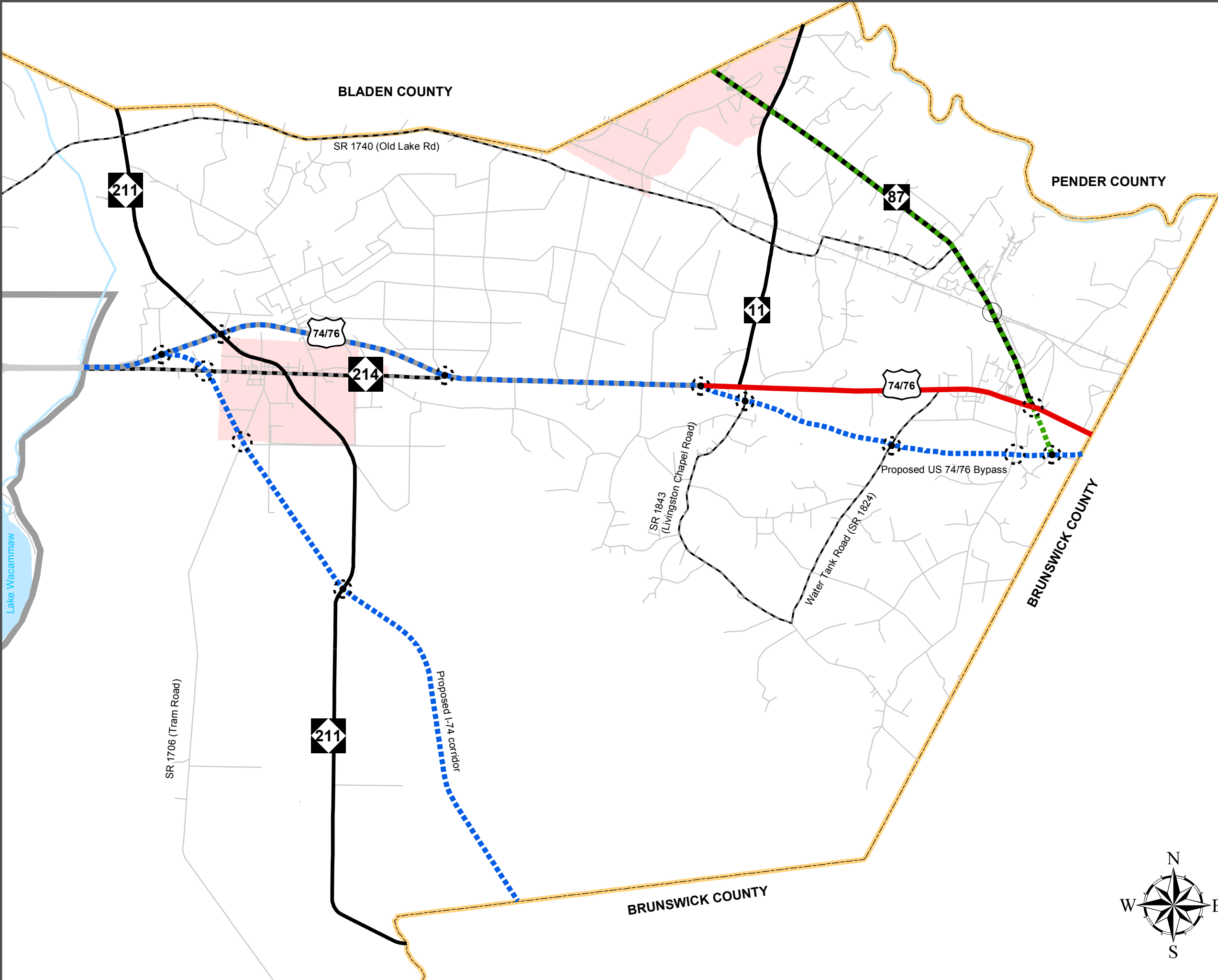


Sheet 2A of 5

Base map date: April 30, 2005

Refer to CTP document for more details

Figure 1 - Sheet 2A



Public Transportation and Rail Map



Columbus County

Comprehensive Transportation Plan

Plan date: August 4, 2006

Bus Routes

- Existing
- Needs Improvement
- Recommended

Fixed Guideway

- Existing
- Needs Improvement
- Recommended

Operational Strategies

- Existing
- Needs Improvement
- Recommended

Rail Corridor

- Active
- Inactive
- Recommended

High Speed Rail Corridor

- Existing
- Recommended

Rail Stops

- Existing
- Recommended

Intermodal Connector

- Existing
- Recommended

Park and Ride Lot

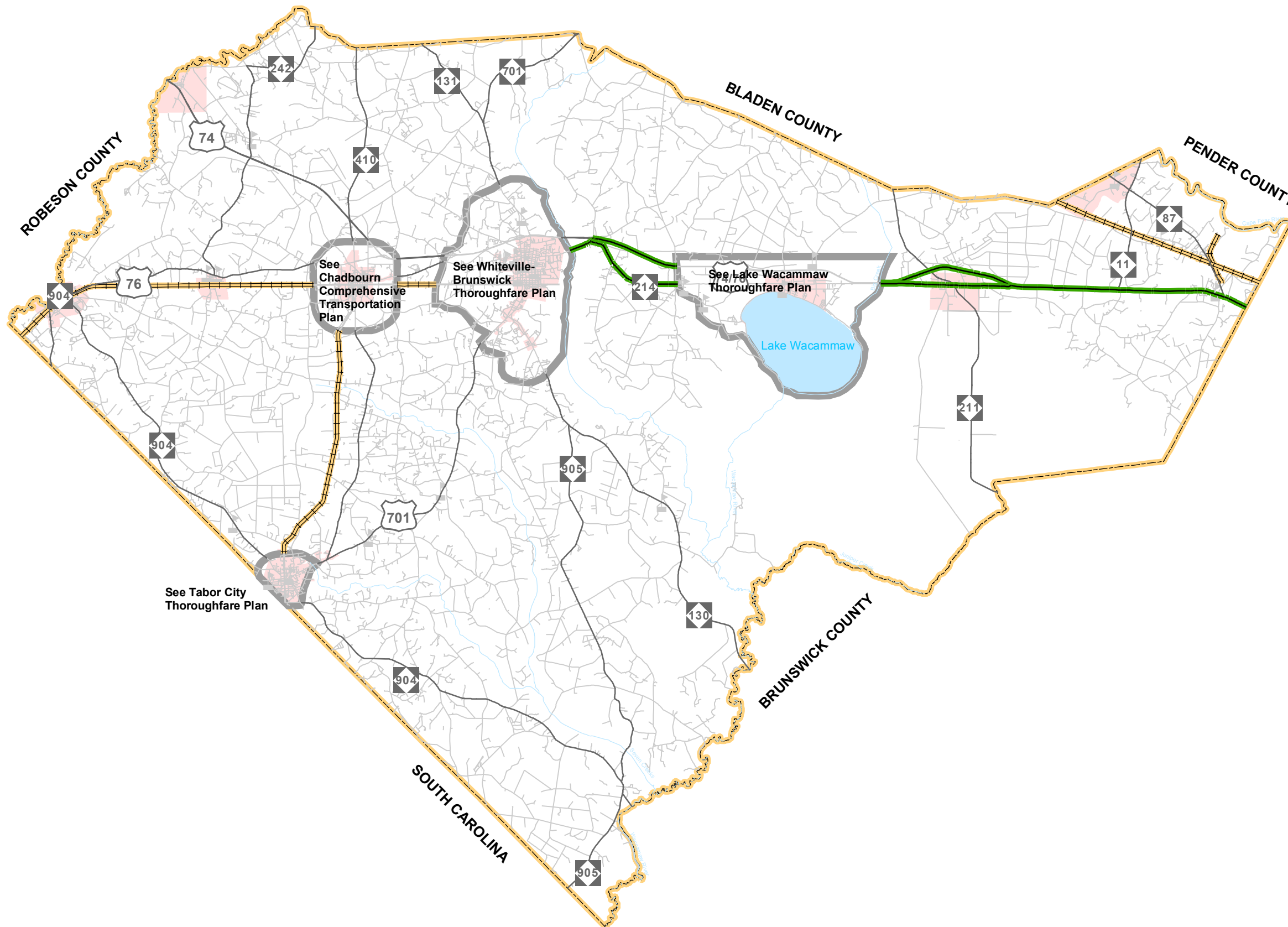
- Existing
- Recommended



Sheet 3 of 5

Base map date: December 8, 2005

Figure 1 - Sheet 3



I. Introduction

An area's transportation system is its lifeline, contributing to its economic prosperity and social well being. The importance of a safe and efficient transportation infrastructure cannot be overstressed. This system provides a means of transporting people and goods from one place to another quickly, conveniently, and safely. A well-planned system will meet the existing travel demands, as well as keep pace with the growth of the region. Columbus County recognized the importance of planning for future transportation needs and requested transportation planning assistance from the Transportation Planning Branch of the North Carolina Department of Transportation (NCDOT).

Columbus County is located in southeastern North Carolina. The County is adjacent to South Carolina and bordered by Robeson, Bladen, Pender and Brunswick Counties. The geographical location is shown in Figure 2.

This report documents the development of the 2007 Columbus County Comprehensive Transportation Plan (CTP) shown in Figure 1. In addition, this report presents recommendations for each relevant mode of transportation in the County. A comprehensive transportation plan is developed to ensure that the transportation system will be progressively enhanced to meet the needs of the planning area. It will serve as an official guide, providing a well-coordinated, efficient, and economical transportation system that utilizes all modes of transportation. This document will be used by local officials to ensure that planned transportation facilities reflect the needs of the public, while minimizing the disruption to local residents, businesses, and the environment.

The purpose of this study is to examine present and future transportation needs of the area and develop a transportation plan to meet these needs. The plan recommends those improvements that are necessary to provide an efficient transportation system within the 2005-2030 planning period. The recommended cross-sections outlined in Appendix D for these improvements are based on existing and projected conditions.

The proposed Comprehensive Transportation Plan is based on the projected growth for the planning area as coordinated with the County Planners. It is possible that actual growth patterns will differ from those logically anticipated. As a result, it may be necessary to accelerate or delay the development of some recommendations found within this plan. Some portions of the plan may require revisions in order to accommodate unexpected changes in development. Therefore, any changes made to one element of the Comprehensive Transportation Plan should be consistent with the other elements.

Initiative for implementing the CTP rests predominately with the policy boards and citizens of the County. Columbus County and the North Carolina Department of Transportation share the responsibility for the construction of the recommended projects. As transportation needs throughout the State exceed available funding, it is imperative that the local planning area aggressively pursue funding for desired projects.

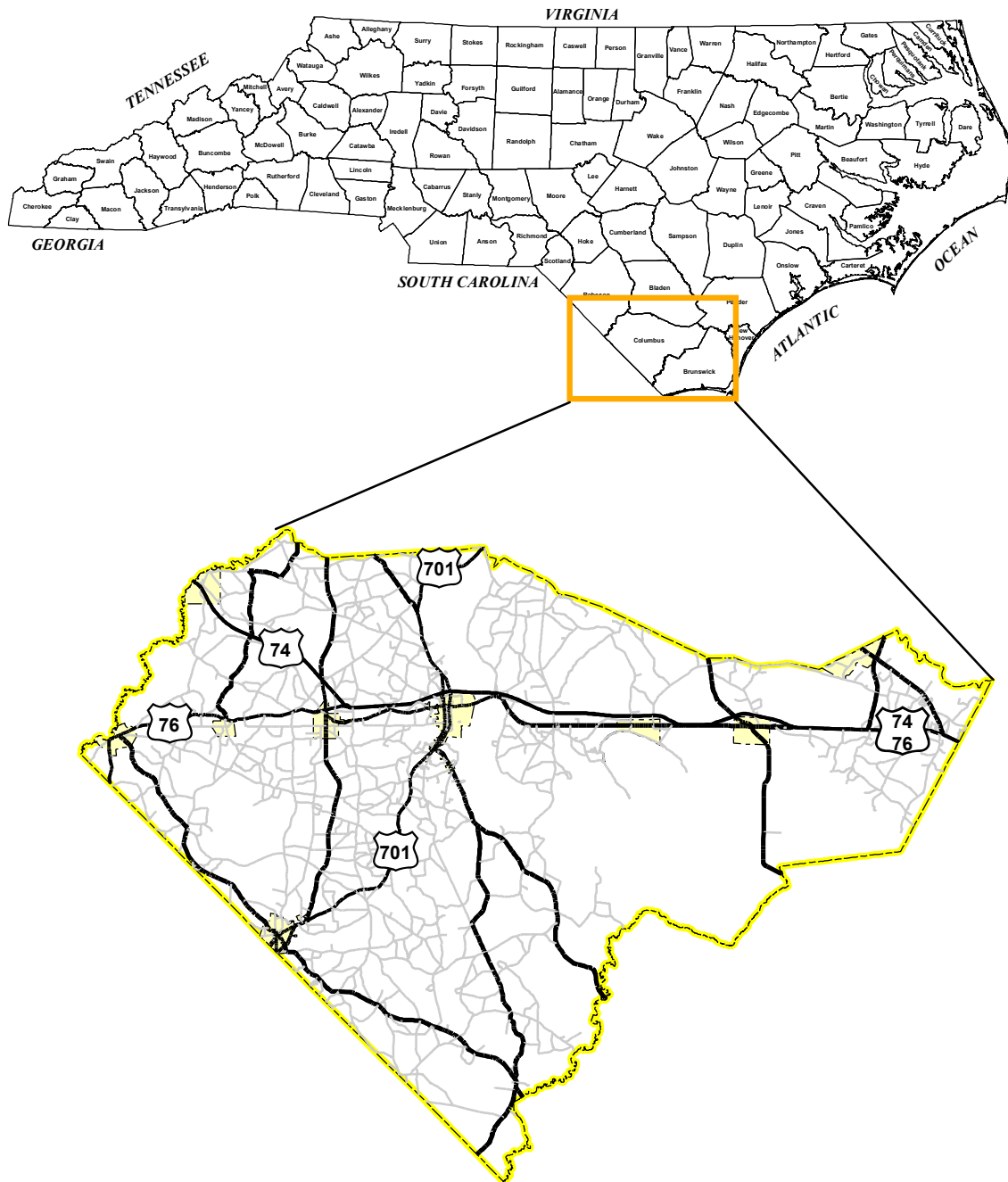


FIGURE 2 GEOGRAPHIC LOCATION

COUNTY OF
COLUMBUS

NORTH CAROLINA



PREPARED BY THE
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING BRANCH**

IN COOPERATION WITH THE
**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CAPE FEAR RPO
COLUMBUS COUNTY**

BASE MAP DATE: APRIL 30, 2005

II. Recommendations

This chapter contains recommendations that are based on the ability of the area's roadway system to serve existing and anticipated travel demands. The objective is to reduce congestion and improve safety by eliminating both existing and projected deficiencies in the transportation system. The adopted plan represents a transportation system that will address anticipated traffic and land development needs.

HIGHWAY MAP

The highway element of the Columbus County Comprehensive Transportation Plan (CTP) is presented in Figure 1 (Sheet 2 and Sheet 2A). This plan includes roadways within the County that fall into five general categories: freeways, expressways, boulevards, other major thoroughfares, and minor thoroughfares. Refer to Appendix C for an inventory of the existing and recommended highway attributes and Appendix D for a listing of typical cross-sections used by NCDOT.

The process of formulating and evaluating recommendations for the facilities in the CTP involves many factors including the goals and objectives of the area, existing roadway conditions, identified roadway deficiencies, environmental impacts, and existing and anticipated land development. Consideration of these factors led to the development of the recommended improvements. A detailed description for each is listed below.

Major Thoroughfare Improvements

I-74

- **Project Recommendation:** In accordance with the NCDOT Strategic Highway Corridors (SHC) Report and the R-3436 feasibility study, it is recommended that I-74 be constructed on new location from 1.0 mile west of the US 74/76 and NC 211 intersection southeast to the Brunswick County line. Freeway standards are recommended on this facility with interchanges located at US 74 and NC 211. Grade separations are recommended at NC 214 and Tram Road (SR 1706). The total project length is 9 miles.
- **Transportation Demand:** I-74 will be functionally classified as a freeway and will serve intrastate and interstate travel. This facility will be an essential interstate link from Myrtle Beach, SC to Detroit, MI. Within the state, this route connects the Triad area with southeastern North Carolina. This corridor will be a primary connection for moving goods and services throughout the state.
- **Roadway Capacity and Deficiencies:** The current average annual daily traffic (AADT) along existing US 74, within the planning area, ranges from 9,900 to 18,700 vehicles per day (vpd). The capacity of the existing US 74 is 37,900 vpd. The projected

2030 AADT of 16,200 to 30,700 vpd will result in sections of existing US 74 being near capacity in the design year.

- Social Demands and Economic Development: As a SHC, it has been determined that I-74 will contribute toward statewide mobility and connectivity, promote a vision of modern transportation, and support economic opportunities and environmental excellence. This facility will also enhance residential and commercial development in southeastern North Carolina.
- System Linkage: The primary purpose of the North Carolina Strategic Highway Corridors is to provide a network of high-speed, safe, reliable highways throughout the State. As a SHC, I-74 provides connectivity between major activity centers and many other strategic corridors. {Greensboro (I-40), Rockingham (I-73), Lumberton (I-95), Brunswick County (US 17), and Columbus County (I-20)}
- Relationship to Other Plans: The recommendations made for I-74 is consistent with the North Carolina Strategic Corridor Plan that designates this segment of I-74 as a freeway. This project is not identified on any other adopted transportation plan.

I-20

- Project Recommendation: In accordance with the SHC Report, it is recommended that I-20 be constructed on new location from the South Carolina state line to the western boundary of the Chadbourn planning area. Freeway standards are recommended on this facility with interchanges located at NC 904 and Academy Street (SR 1004). Grade separations are recommended at US 76, Old Stake Road (SR 1300), and Cedar Grove Church Road (SR 1410). The total length of the project is 11 miles.
- Transportation Demand: I-20 will be functionally classified as a freeway and will serve intrastate and interstate travel. The interstate extension will complete I-20 from Texas to the North Carolina coast by providing a connection from Florence, SC to Wilmington, NC. The corridor will provide a primary connection for moving goods and services from the Port of Wilmington to the southeastern United States.
- Social Demands and Economic Development: As a SHC, it has been determined that I-20 will contribute toward interstate mobility and connectivity, promote a vision of modern transportation, and support economic opportunities, and environmental excellence. This facility will also promote commercial development along the corridor.
- System Linkage: As a SHC, this facility will enhance connectivity between large commercial centers and small towns throughout Columbus County and southeastern North Carolina. It also provides linkage to other SHC. {Columbus County (I-74 and NC 87), Brunswick County (US 17)}

- Relationship to Other Plans: The recommendations made for I-20 are consistent with the North Carolina Strategic Corridor Plan that designates this segment of I-20 as a freeway. This project is also identified in the Chadbourn Comprehensive Transportation Plan.

US 74

- Project Recommendation: In accordance with the SHC Report, it is recommended that US 74 be upgraded to freeway standards from the Robeson County line to the Chadbourn planning area boundary. In accordance with the TIP Project R-4900, an interchange is recommended at NC 242. An interchange at Macedonia Church Road (SR 1506) is also recommended.

In accordance with the TIP Project R-4462, the recommendations are as follows: The section of roadway from Red Hill Road (SR 1700) to the western boundary of the Lake Waccamaw planning area is to be upgraded to freeway standards with an interchange at the Hallsboro Road (SR 1001) intersection. The section of roadway from the eastern boundary of the Lake Waccamaw planning area to 0.5 miles west of the NC 11 intersection is recommended to be upgraded to freeway standards with interchanges at the proposed I-74 and NC 214. In accordance with TIP Project R-61C, and interchange is recommended at NC 211.

From 0.5 miles west of the NC 11 intersection, US 74 will be realigned on new location south of the existing alignment in accordance with feasibility study FS-9903A. This facility will intersect with the existing alignment of US 74/76 in Brunswick County. Freeway standards are recommended with interchanges at the intersections of the existing US 74/76, Livingston Chapel Road (SR 1843), Water Tank Road (SR 1824) and at the proposed extension of NC 87.

- Transportation Demand: US 74 is functionally classified as a principal arterial and primarily serves intra-state travel. This facility is a primary route connecting western North Carolina to the coast. It also provides direct access from Charlotte to the eastern part of the state allowing for the transport of goods and services from the port cities to major municipal centers.
- Roadway Capacity and Deficiencies: The current AADT on US 74 ranges from 9,900 to 18,700 vpd. The capacity of the roadway varies from 37,900 to 40,800 vehicles per day (vpd). The projected 2030 AADT of 16,200 to 30,700 vpd will result in sections of the roadway being near capacity. US 74 is currently operating at level of service (LOS) C and, without any improvements will be operating at LOS D by the year 2030, based on traffic growth projections. The proposed cross-section of a four-lane freeway facility will provide a capacity of approximately 40,800 vpd and will improve the facility to LOS C.
- Safety Issues: Between January 2001 and December 2003, the majority of the high crash locations in the state occur along US 74. Of the seven locations, six are located directly along the corridor within Columbus County. This facility accounts for

91 of the 103 crashes that happen at high crash locations in the planning area. The high crash intersections include: Strawberry Boulevard (SR 1574), 21 crashes; NC 211, 20 crashes; NC 242, 17 crashes; Red Hill Road (SR 1700) and NC 410 each with 11 crashes. Improving this facility to freeway standards and providing grade-separated intersections will significantly decrease the potential for crashes at these locations.

- Social Demands and Economic Development: This facility is primarily used as an east-west connector for the coast and western North Carolina. There is one high school located directly off of the route north of Lake Waccamaw. This corridor also provides access to the seasonal tourist destination of Lake Waccamaw. There is little economic development along the facility except for the eastern end of the county.
- System Linkage: The primary purpose of North Carolina Strategic Highway Corridors is to provide a network of high-speed, safe, reliable highways throughout the State. As a SHC, US 74 provides connectivity between major municipalities and five other strategic corridors. {Rockingham (I-73), Lumberton (I-95), Brunswick County (US 17), and Columbus County (I-74 and I-20)}

This segment of US 74 is an integral part of the North Carolina Intrastate System and the National Highway System. It is also identified as a STRAHNET route and Hurricane Evacuation Route from the Brunswick County Line to Chadbourn.

- Relationship to Other Plans: The recommendations for US 74 are consistent with the SHC Report, which classifies the facility as a freeway. They are also consistent with the Chadbourn Comprehensive Transportation Plan, the Whiteville Thoroughfare Plan and the Lake Waccamaw Thoroughfare Plan.

NC 87

- Project Recommendation: In accordance with the SHC Report and TIP Project R-2561, it is recommended that NC 87 be improved to expressway standards. It is also recommended to extend the facility on new location from existing US 74/76 to the recommended new location of US 74/76. An interchange is recommended at the intersection of NC 87 and the proposed new location of US 74/76 and a grade separation is recommended at the existing US 74/76 and NC 87 intersection. Recommendations include converting the two-lane facility into a four-lane divided facility and implementing access management strategies, i.e., reduction and/or timing of traffic signals, driveway sharing, access roads, etc. The proposed project is 8.0 miles in length.
- Transportation Demand: NC 87 is functionally classified as a minor arterial and primarily serves intra-state travel. This route accommodates civilian and commercial traffic from Virginia to eastern North Carolina. The corridor is also a primary route for military traffic between Fort Bragg, Sunny Point Military Ocean Terminal, and North Carolina port cities.

- Roadway Capacity and Deficiencies: The current AADT on NC 87, ranges from 4,400 to 10,200 vpd. The capacity of the roadway is 10,600 vpd. The projected 2030 AADT of 7,200 to 13,100 vpd will result in sections of NC 87 being over capacity. Twelve percent of the route's traffic is due to truck traffic. NC 87 is currently operating at LOS D and, without any improvements, will be operating at LOS E by the year 2030, based on traffic growth projections. The proposed cross-section, a four-lane divided facility, will provide a capacity of approximately 37,800 vpd and will improve the level of service to B.
- Safety Issues: Between January 2001 and December 2003, two of the seven highest crash locations occurred along NC 87. Twelve crashes were at the intersection with NC 11 and eleven occurred at the intersection with US 74/76. Improving NC 87 to expressway standards will employ access management strategies for the facility thereby reducing the potential for crashes.
- Social Demands and Economic Development: The NC 87 corridor connects an International Paper Mill with neighboring counties and commercial centers. It is anticipated that the proposed enhancements will promote new economic growth for the area. As a SHC it has been determined that NC 87 contributes toward statewide mobility and connectivity and promotes a vision of modern transportation which is supportive of economic opportunities, and environmental excellence. Economic development is fostered by the usage of NC 87 as a truck route to the mill and the ports.
- System Linkage: The primary purpose of North Carolina Strategic Highway Corridors (SHC) is to provide a network of high-speed, safe, reliable highways throughout the State. As a SHC, NC 87 provides connectivity between major state activity centers and four other strategic corridors. {Fayetteville (I-95), Brunswick County (US 17), and Columbus County (I-74 and I-20)}

This segment of NC 87 is also identified as a STRAHNET route. Further, it is a designated route on the North Carolina Intrastate System and the National Highway System.

- Relationship to Other Plans: The recommendations made for NC 87 is consistent with the North Carolina Strategic Corridor Plan that designates this segment of NC 87 as an Expressway. This project is not identified on any other adopted transportation plan.

US 74/76 BUS

- Project Recommendation: It is recommended that the section of roadway from US 74 to the western boundary of the Whiteville planning area be improved to boulevard standards. The existing two and three-lane facility should be improved to a four-lane divided highway with partial control of access. The total length of the project is 1.5 miles.

- Transportation Demand: US 74/76 BUS is functionally classified as a major collector and primarily serves intra-state travel. This facility provides access from the eastern city limits of Whiteville to US 74. This corridor is a primary route for access to the Columbus County Hospital.
- Roadway Capacity and Deficiencies: The current AADT on US 74/76 BUS is 11,200 vpd. The current capacity of the roadway is 10,600 vpd resulting in the facility being over capacity. The projected 2030 AADT of 14,400 vpd will result in the facility being more congested in the design year. US 74/76 BUS is currently operating at LOS D and, without any improvements will continue to operate at LOS D by the year 2030 based on traffic growth projections. The proposed cross-section, a four-lane divided facility, will provide a capacity of approximately 40,500 vpd and will improve level of service to B.
- Safety Issues: From January 2001 and December 2003 there were no locations along US 74/76 BUS in the project area with more than ten crashes.
- Social Demands and Economic Development: This corridor is a direct provider of services from the Columbus County Hospital to the county. Improvements will promote this facility as an alternative from US 74 for people, commercial goods and services to travel into Whiteville from the east.
- System Linkage: US 74/76 BUS provides access to US 76, a SHC route, for the citizens of Whiteville. It also provides an alternate east-west route in the event of congestion or a crash on US 76.
- Relationship to Other Plans: US 74/76 BUS is identified in the Whiteville Thoroughfare Plan to be improved to a four-lane facility.

US 701

- Project Recommendation: It is recommended that the section of roadway from NC 131 to the northern boundary of the Whiteville planning area and the section from the southern boundary of the Whiteville planning area to the northern boundary of the Tabor City planning area be upgraded to boulevard standards. The existing two and three-lane facility should be improved to a four-lane divided highway with partial control of access. The total length of the project is 17 miles.
- Transportation Demand: Within the planning area, US 701 is functionally classified as a minor arterial. This north-south route primarily serves as a connector between the South Carolina State line near Tabor City and central North Carolina. It provides direct access to South Columbus High School and provides a direct route between the two largest towns in the county, Whiteville and Tabor City.
- Roadway Capacity and Deficiencies: The current AADT ranges from 5,700 vpd on the northern section to 6,300 vpd on the southern portion of this facility. The

capacity of US 701 is 10,600 vpd throughout the county. In 2030, the AADT ranges from 9,400 to 10,400 vpd resulting in US 701 being near capacity. US 701 is currently operating at LOS C and, without any improvements, will be operating at LOS D by the year 2030, based on the traffic growth projections. The proposed cross section, a four-lane divided facility, will provide a capacity of approximately 39,500 vpd and will improve the level of service to A.

- Safety Issues: From January 2001 and December 2003 there were no locations along US 701 in the project area with more than ten crashes.
- Social Demands and Economic Development: This north-south corridor is located in the central part of the planning area. The primary land use along this facility is agricultural. The widening of US 701 will provide truck traffic, farmers and tourists with a divided, safe route through the rural section of the county.
- System Linkage: This route is a connector between central North Carolina and the South Carolina State line at Tabor City, NC. It provides direct access from the southern portion of North Carolina to numerous Strategic Highway Corridors. {Smithfield (I-95), Clinton (NC 24), (I-40), Elizabethtown (NC 87), and Whiteville (I-74)}
- Relationship to Other Plans: This route is included in the Tabor City and Whiteville Thoroughfare Plans. In both plans, US 701 is recommended to be a four-lane divided facility.

NC 130

- Project Recommendation: It is recommended that NC 130 from the southern boundary of the Whiteville planning area to the Brunswick County line be upgraded to boulevard standards. The existing facility should be improved to a four-lane divided highway with partial control of access. The total project length is 16 miles.
- Transportation Demand: Within the planning area NC 130 is functionally classified as a minor arterial. This route primarily serves as a connector between the Brunswick County beaches and southern North Carolina.
- Roadway Capacity and Deficiencies: The current AADT ranges from 3,500 to 6,900 vpd. The capacity of the roadway is 10,600 vpd. In 2030, the AADT ranges from 5,800 to 11,300 vpd resulting in portions of the facility being over capacity. NC 130 is currently operating at LOS D and, without any improvements, will be operating at LOS E by the year 2030, based on traffic growth projections. The proposed cross section, a four-lane divided facility, will provide a capacity of approximately 39,500 vpd and will improve level of service to A.
- Safety Issues: From January 2001 and December 2003 there were no locations along NC 130 in the project area with more than ten crashes.

- Social Demands and Economic Development: Agriculture is the primary land use in this region of the planning area with a few residential areas directly adjacent to the facility. The potential for new development is evident as the coastal communities begin to expand into the planning area.
- System Linkage: This route is a direct route to North Carolina beach areas. This facility is designated as a Hurricane Evacuation Route and is utilized by trucks to transport goods from the port cities throughout the state. NC 130 also provides access to US 74, a SHC route, in Whiteville.
- Relationship to Other Plans: The facility is included in the Whiteville Thoroughfare Plan. It is recommended as a four-lane divided facility.

Widening Projects

The following roadway sections are recommended widening projects that will improve safety and increase capacity. Each of the sections of roadway listed below currently has lane widths less than 12 feet and based on the traffic volumes on the roads are recommended to be widened.

Table 1: Narrow Roads		
Facility	From	To
US 76	South Carolina State Line	Chadbourn planning area
NC 131	US 701	Bladen County line
NC 214	US 74/76 Bus	US 74/76
NC 410	US 701	Bladen County line
NC 904	Robeson County line	Brunswick County line
NC 905	South Carolina State Line	NC 130
Hallsboro Road (SR 1001)	NC 130	Bladen County line
Old Lumberton Road (SR 1002)	US 701	Robeson County line
Rough and Ready Road (SR 1004)	NC 904	US 701
Peacock Road (SR 1005)	NC 904	Chadbourn planning area
Old Dock Road (SR 1006)	NC 130	NC 904
Old Tram Road (SR 1159)	Poley Bridge Road (SR 1212)	Ford Road (SR 1157)
Antioch Church Road (SR 1162)	Ford Road (SR 1157)	Pleasant Plains Road (SR 1166)
Pleasant Plains Road (SR 1166)	NC 130	Whiteville planning area
Old Stake Road (SR 1300)	Tabor City planning area	Emerson Church Road (SR 1310)
Ten Mile Road (SR 1308)	Emerson Church Road (SR 1310)	Sidney Road (SR 1314)

Table 1(continued): Narrow Roads		
Emerson Church Road (SR 1310)	Old Stake Road (SR 1300)	Ten Mile Road (SR 1308)
Clarendon Road (SR 1317)	Sidney Road (SR 1314)	Chadbourn planning area
Beaver Dam Road (SR 1324)	US 701	NC 410
Powell Street (SR 1407)	Main Street (SR 1408)	US 76
Main Street (SR 1408)	Powell Street (SR 1407)	Cedar Grove Church Road (SR 1410)
Cedar Grove Church Road (SR 1410)	Main Street (SR 1408)	Cerro Gordo City limits
Blackwell Road (SR 1412)	Old Stake Road (SR 1300)	Cedar Grove Church Road (SR 1410)
Lewis Road (SR 1415)	Cedar Grove Church Road (SR 1410)	Cherry Street (SR 1352)
Slippery Log Road (SR 1429)	Chadbourn planning area	Whiteville planning area
Grist Road (SR 1443)	US 76	Braswell Road (SR 1414)
Smyrna Road (SR 1552)	Whiteville planning area	Peacock Road (SR 1005)
Klondike Road (SR 1572)	NC 410	Peacock Road (SR 1005)
Red Hill Road (SR 1700)	Bladen County line	US 74
Old Lake Road (SR 1740)	NC 87	US 74/76
Water Tank Road (SR 1824)	Livingston Chapel Road (SR 1843)	US 74/76
Livingston Chapel Road (SR 1843)	Water Tank Road (SR 1824)	US 74/76

Bicycle Map

There are no designated State bike routes or locally planned bike routes or greenways within the study area. Therefore, a map of this element was not included in the plan.

Public Transportation and Rail Map

The Public Transportation and Rail Element of the transportation plan is an innovative way to consider other modes of transportation and give the public other options of traveling from one place to another. Today, the emphasis is on obtaining a balance between a walking society and a riding society. There are no improvements planned for the existing public transportation and rail system for Columbus County.

The public transportation and rail map for the planning area is presented on Sheet 3 of Figure 1. See Appendix B for a more detailed description of each category and refer to Appendix C for the public transportation and rail inventory.

Pedestrian Map

The format for the Pedestrian Map is still under development; therefore no map is included.

III. Implementation

Implementation is one of the most important aspects of the comprehensive transportation plan. If implementation is not an integral part of this process, the effort and expense associated with developing the plan will be lost. There are several tools available for use by the County to assist in the implementation of the CTP. They are described in detail in this chapter.

State-County Adoption of the CTP

Columbus County and the North Carolina Department of Transportation have mutually approved the CTP shown in Figure 1. The mutually adopted plan can now serve as a guide for the Department of Transportation in the development of the transportation system for the County. The approval of this plan by the County also enables standard road regulations and land use controls to be used effectively in the implementation of this plan. As part of the plan, the County and Department of Transportation shall reach agreement on the responsibilities for existing and proposed streets and highways. Facilities which are designated a State responsibility will be constructed and maintained by the Division of Highways.

Methods Used to Protect the Adopted CTP

Subdivision Regulations

Subdivision regulations require every subdivider to submit to the County Planning Commission a plan of any proposed subdivision. It also requires that subdivisions be constructed to meet certain standards. Through this process, it is possible to require the subdivision streets to conform to the CTP and to reserve or protect necessary right-of-way for proposed roads and highways that are a part of the CTP.

The construction of subdivision streets to adequate standards reduces maintenance costs and simplifies the transfer of streets to the State Highway System. Appendix F outlines the recommended subdivision design standards as they pertain to road construction.

Zoning Ordinances

A zoning ordinance can be beneficial to transportation planning by designating appropriate locations of various land use and allowable densities of residential development. This provides a degree of stability on which to make future traffic projections and to plan streets and highways.

Other benefits of good zoning ordinance are: (1) the establishment of standards of development which will aid traffic operations on major thoroughfares and (2) the

minimization of strip commercial development which creates traffic friction and increases the traffic accident potential.

Future Street Line Ordinances

A municipality with legislative approval may amend its charter to be empowered to adopt future street line ordinances. This ordinance, enacted for selected streets, is particularly beneficial for planned future improvements, such as roadway widening. Through a metes-and-bounds description of a street's future right-of-way requirements, the municipality may prohibit new construction or reconstruction of structures within the future right-of-way. This approach requires specific design hearings to be held as an opportunity for affected property owners to obtain information about what to expect and to make necessary adjustments without undue hardship.

Roadway Corridor Official Maps

A Roadway Corridor Official Map (Official Map) is a document adopted by the North Carolina Board of Transportation which allows the reservation of roadway corridors as provided by General Statutes 136-44.50 through 136-44.54. Official Maps place temporary restrictions on private property rights by prohibiting the issuance of a building permit or the approval of a subdivision on property within an adopted alignment, for up to a three-year period beginning when a request for development is denied. The Official Map in effect serves as notice to developers that the State or Municipality intends to acquire specific property. This process is a beneficial tool in directing development so those sites can be reserved for public improvements in anticipation of actual need.

Development Reviews

The District Engineer's Office and the Traffic Engineering Branch of the North Carolina Department of Transportation review driveway access to any state-maintained road. In addition, any development expected to generate large volumes of traffic (e.g., shopping centers, fast food restaurants, or large industries) should be comprehensively studied by the Traffic Engineering Branch, the Project Development and Environmental Analysis Branch, and/or the Roadway Design Unit of NCDOT. If reviewed at an early stage, it is often possible to significantly improve the development's accessibility while preserving the integrity of the CTP.

Funding Sources

Capital Improvements Program

A capital improvement program makes it easier to build a planned transportation system. It consists of two lists of projects. The first is a list of highway projects that are designated as a municipal responsibility and are to be implemented with municipal funds. The second is a list of local projects designated as State responsibility to be included in the State's Transportation Improvement Program.

Transportation Improvement Program

North Carolina's Transportation Improvement Program (TIP) is a document that lists all major transportation projects, and their funding sources, planned by the NCDOT for a seven-year period. Every two years, when the TIP is updated, completed projects are removed, programmed projects are advanced, and new projects are added.

During biennial TIP public hearings, municipalities, local citizens groups, and other interested parties request projects to be included in the TIP. The group requesting a particular project(s) should submit to the NCDOT Board of Transportation Member representing their area the following: a letter with a prioritized summary of requested projects, TIP candidate project request forms, and project location maps with a description of each project. Refer to Appendix G for an example of a TIP project request package. Local areas should work within their respective Rural Planning Organization (RPO) to develop local and regional project priorities.

The Board of Transportation reviews all of the project requests from each area of the state. Based on the technical feasibility, need, and available funding, the board decides which projects will be included in the TIP. In addition to highway construction and widening, TIP funds are available for bridge replacement, highway safety projects, public transit projects, railroad projects and bicycle facilities.

Industrial Access Funds

If certain economic conditions are met, Industrial Access Funds are available for construction of access roads for industries that plan to develop property that does not have access to any state-maintained road. The NCDOT Secondary Roads Office should be contacted for information on Industrial Access Funds.

Small Urban Funds

Small Urban Funds are annual discretionary funds that are made available to municipalities with qualifying projects on the state system. The maximum amount is one million dollars per year per highway division. Requests for Small Urban Fund assistance should be directed to the Division Engineer or to the Program Development Branch of NCDOT.

The North Carolina Highway Trust Fund Law

The Highway Trust Fund Law was established in 1989 as a plan with four major goals for North Carolina's roads and highways. These goals are:

1. To complete the remaining 1,716 miles of four lane construction on the 3,600 mile North Carolina Intrastate System.
2. To construct a multilane connector in Asheville and portions of multilane loops in Charlotte, Durham, Greensboro, Raleigh, Wilmington, and Winston-Salem.
3. To supplement the secondary roads appropriation in order to pave, by 1999, 10,000 miles of unpaved secondary roads carrying 50 or more vehicles per day, and all other unpaved secondary roads by 2006.
4. To supplement the Powell Bill Program.

Over the thirty year planning period, the County should look forward to the paving of most, if not all, of its unpaved roads on the state maintained system. For more information on the Highway Trust Fund Law, contact the Program Development Branch of the North Carolina Department of Transportation.

Implementation Recommendations

The following table gives recommendations for the most suitable funding sources and methods of implementation for the major project proposals of the Columbus County CTP.

Table 2: Funding Sources and Recommended Methods of Implementation

Projects	Funding Sources				Methods of Implementation				
	Local Funds	TIP Funds	Industrial Access	Small Urban	CTP	Subd. Ord.	Zoning Ord.	Future Street Lines	Develop Review
I-74 New Location		X			X	X	X	X	X
I-20 New Location		X			X	X	X	X	X
US 74/76 Improvements and New Location		X			X	X	X		X
US 74/76 BUS Widening		X			X		X	X	X
US 701 Widening		X			X		X	X	X
NC 87 Widening		X			X		X	X	X
NC 130 Widening		X			X		X	X	X

IV. Population, Land Use, and Existing Transportation System

In order to fulfill the objectives of an adequate long-range transportation plan, reliable forecasts of future travel patterns must be achieved. Such forecasts depend on careful analysis of the following items: historic and potential population changes, significant economic trends, character and intensity of land development and the ability of the transportation system to meet existing and future travel demand. Secondary items that influence forecasts include the effects of legal controls such as zoning ordinances and subdivision regulations, availability of public utilities and transportation facilities, and other physical features of the area.

Population

Since the volume of traffic on a roadway is related to the size and distribution of the population that it serves, population data is used to aid the development of the transportation plan. Future population estimates typically rely on the observance of past population trends and counts. Table 3 presents the population trends for Columbus County and North Carolina as established by the North Carolina Office of State Budget and Management.

Table 3: Population Growth					
Location	1970	1980	1990	2000	2030
North Carolina	5,082,059	5,881,766	6,628,637	8,046,485	12,447,597
Columbus County	46,937	51,037	49,587	54,749	60,078

Land Use

Land use refers to the physical patterns of activities and functions within an area. Traffic demand in a given area often can be attributed to adjacent land use. For example, a shopping center generates larger traffic volumes than a residential area. The spatial distribution of different types of land uses is a predominant determinant of when, where, and to what extent traffic congestion occurs. The travel demand between different land uses and the resulting impact on traffic conditions varies depending on the size, type, intensity, and spatial separation of development. Even commercial and residential traffic generation patterns have different peaks based on the time of day and

the day of the week. For transportation planning purposes, land use is divided into the following categories:

- Residential: All land is devoted to the housing of people, with the exception of hotels and motels.
- Commercial: All land is devoted to retail trade including consumer and business services and their offices; this may be further stratified into retail and special retail classifications. Special retail would include high-traffic establishments, such as fast food restaurants and service stations; all other commercial establishments would be considered retail.
- Industrial: All land is devoted to the manufacturing, storage, warehousing, and transportation of products.
- Public: All land is devoted to social, religious, educational, cultural, and political activities; this would include the office and service employment establishments.
- Agricultural: All land is devoted to the use of buildings or structures for the raising of non-domestic animals and/or growing of plants for food and other production.

Vision for Future Land Use

The County is working to complete a Land Use Plan update. The County views its primary current and future land use for the planning area as agricultural. Residential, commercial and industrial are the secondary current and future land uses for the planning area. Substantial growth is not expected throughout the planning area with the exception of a Federal Prison in northeast Tabor City. The County expects past trends of minimal growth and development to continue and follow existing land use and development patterns in the future.

Roadway System

An important stage in the development of a CTP is the analysis of the existing roadway system and its ability to serve the area's travel desires. Emphasis is placed not only on detecting the existing deficiencies, but also on understanding the causes of these deficiencies. Roadway deficiencies may result from inadequacies such as pavement widths, intersection geometry, or intersection controls. Deficiencies may also result from system problems, such as the need to construct missing travel links, bypass routes, loop facilities, or additional radial routes.

An analysis of the roadway system looks at both current and future travel patterns and identifies existing and anticipated deficiencies. This is usually accomplished through a traffic crash analysis, roadway capacity deficiency analysis, and a system deficiency analysis. This information, along with population growth, economic development potential, and land use trends, is used to determine the potential impacts of the future system.

Traffic Crash Analysis

Traffic crashes are often used as an indicator for locating congestion and roadway problems. While often the result of driver error or vehicle malfunction, crashes may also

be a result of the physical characteristics of the roadway. Deficiencies such as poor design and obstructions, traffic conditions, limited sight distance and inadequate signing may all lead to a crash. Crash patterns obtained from an analysis of crash data can lead to the identification of improvements that will reduce the number of crashes.

A crash analysis performed for the Columbus County CTP factored crash frequency, crash type, and crash severity. Crash frequency is the total number of reported collisions and contributes to the ranking of the most problematic intersections. These high crash intersections are illustrated in Figure 3. Crash type provides a general description of the crash and allows the identification of any trends that may be correctable through roadway or intersection improvements. Crash severity is the crash rate based upon injuries and property damage incurred.

The severity of every accident is measured with a series of weighting factors developed by the NCDOT Division of Highways (DOH). These factors define a fatal or incapacitating crash as 47.7 times more severe than one involving only property damage, and an accident resulting in minor injury is 11.8 times more severe than one with only property damage. In general, a higher severity index indicates more severe accidents. Listed below are levels of severity for various severity index ranges.

<u>Severity</u>	<u>Severity Index</u>
low	< 6.0
average	6.0 to 7.0
moderate	7.0 to 14.0
high	14.0 to 20.0
very high	> 20.0

Table 4 depicts a summary of the crashes occurring in the planning area between January 2001 and December 2003. This table only includes locations with 10 or more crashes. The "Total" column indicates the total number of accidents reported within 150-ft of the intersection during the study period. The severity listed is the average crash severity for that location.

Table 4: Crash Locations									
Map Index	Location	Angle	Rear End	Left Turn	Side swipe	Fixed Object	Other	Total	Severity
1	US 74 and Strawberry Boulevard (SR 1574)	18	1				2	21	12.8
2	US 74/76 and NC 211	8	5	3	2	2		20	16.07
3	US 74 and NC 242	12	3	1		1		17	26.78
4	NC 87 and NC 11	4	3	3		2	1	13	11.02
5	US 74/76 and Red Hill Road (SR 1700)	3	1		1	5	1	11	2.35
6	US 74 and NC 410	5	3	1		1	1	11	5.04
7	US 74/76 and NC 87	4	4	2		1		11	11.25

The NCDOT is actively involved with investigating and improving many of these locations. To request a more detailed analysis for any of the locations listed in Table 4, or other intersections of concern, contact the Division Traffic Engineer. Contact information for the Division Traffic Engineer is included in Appendix A.

FIGURE 3

CRASH LOCATIONS
for 2001 to 2003

Columbus County
NORTH CAROLINA

LEGEND

- High Crash Locations
- City Boundary
- Urban Planning Boundary

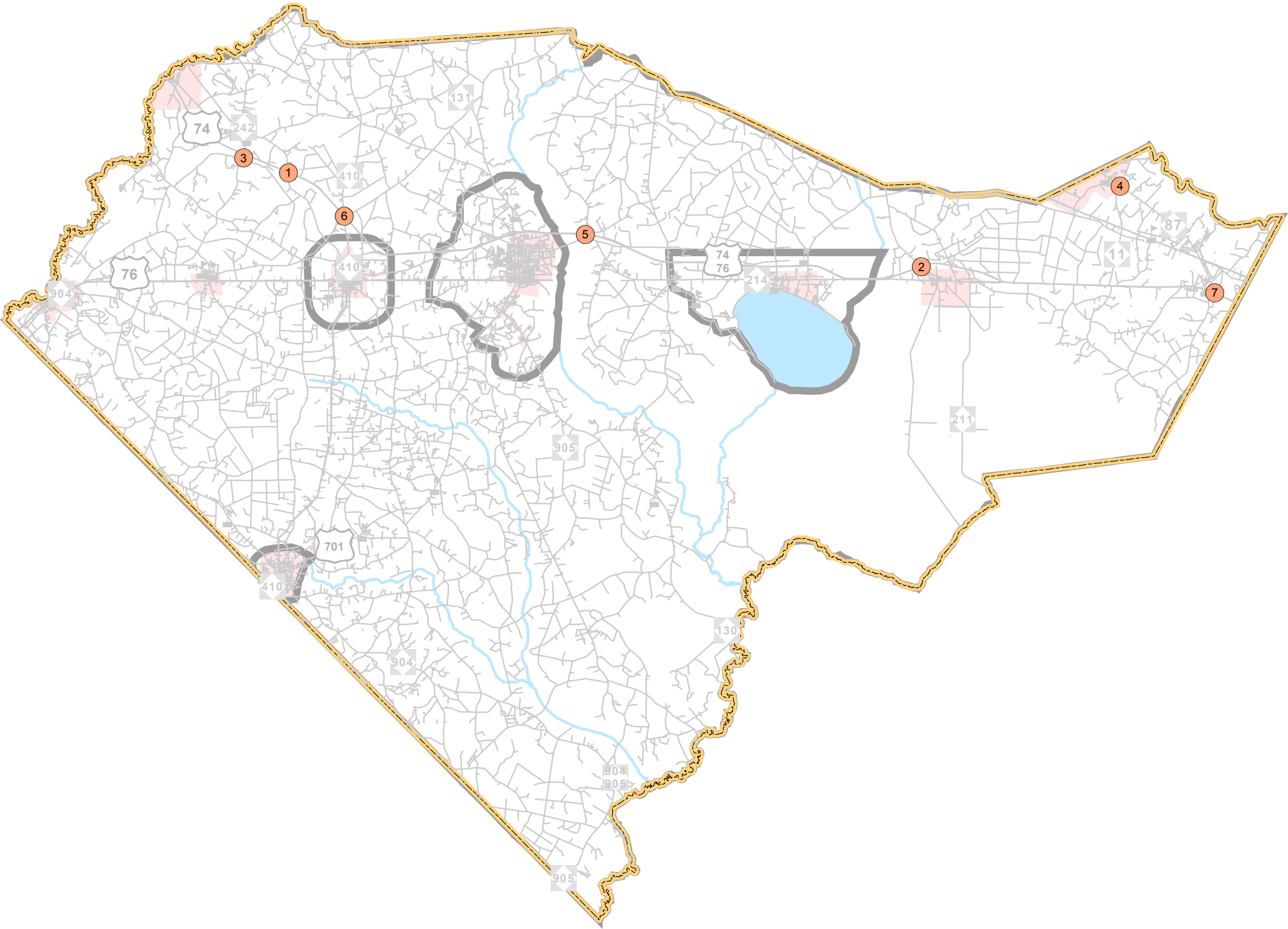
COUNTY OF
COLUMBUS
NORTH CAROLINA

PREPARED BY THE
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TRANSPORTATION PLANNING BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION



0 1 2 4 6 8 Miles

BASE MAP DATE: APRIL 30, 2005



Bridge Conditions

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or deficiency in a bridge reduces the value of the total investment. Third, a bridge presents the greatest opportunity of all potential highway failures for disruption of community welfare. Finally, and most importantly, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons, it is imperative that bridges be constructed to the same design standards as the system of which they are a part.

The Transportation Improvement Program (TIP) development process for bridge projects involves consideration of several evaluation methods in order to prioritize needed improvements. A sufficiency index is used to determine whether a bridge is sufficient to remain in service, or to what extent it is deficient. The index is a percentage in which 100 percent represents an entirely sufficient bridge and zero represents an entirely insufficient or deficient bridge. Factors evaluated in calculating the index are listed below.

- structural adequacy and safety
- serviceability and functional obsolescence
- essentiality for public use
- type of structure
- traffic safety features

The NCDOT Bridge Maintenance Unit inspects all bridges in North Carolina at least once every two years. A sufficiency rating for each bridge is calculated and establishes the eligibility and priority for replacement. Bridges having the highest priority are replaced as Federal and State funds become available.

A bridge is considered deficient if it is either structurally deficient or functionally obsolete. A bridge that is at least ten years old is considered structurally deficient if it is in relatively poor structural condition or has an insufficient load-carry capacity due to either the original design or to deterioration. A bridge is considered functionally obsolete if it is narrow, has inadequate under-clearances, has insufficient load-carrying capacity, is poorly aligned with the roadway, and/or can no longer adequately serve existing traffic.

A bridge must be classified as deficient in order to qualify for Federal replacement funds. Additionally, the sufficiency rating must be less than 50% to qualify for replacement or less than 80% to qualify for rehabilitation under federal funding. Deficient bridges within the planning area are listed in Table 5; the locations of the functionally obsolete and structurally deficient bridges are shown in Figure 4.

Table 5: Deficient Bridges

Map Index	Route	Across	Structurally Deficient	Functionally Obsolete
10	NC130	Waccamaw River Overflow	Yes	Yes
13	NC410	Beaverdam Swamp	No	Yes
14	NC87	Livingston Creek	Yes	No
20	NC904	Fork Juniper Swamp	Yes	No
22	NC87	CSX RR	Yes	No
25	NC130	Waccamaw River Overflow	No	Yes
26	SR1928	Bear Branch	Yes	No
27	NC905	Seven Creeks	No	Yes
32	SR1928	Waccamaw River Overflow	Yes	No
37	SR1157	Beaverdam Swamp	Yes	No
38	SR1141	Branch Monte Swamp	Yes	No
44	NC904	Juniper Swamp	Yes	No
45	SR1108	Branch Sevens Creek	Yes	No
46	SR1932	Creek	Yes	No
49	NC130	Waccamaw River Overflow	No	Yes
60	US701	Prong Creek	Yes	No
76	SR1006	Grissett Swamp	Yes	No
78	SR1006	Grissett Swamp	Yes	No
79	NC904	Flood Control Canal	Yes	No
81	SR1118	Tom's Fork Creek	Yes	No
82	NC214	Green Swamp	Yes	No
85	SR1119	Tom's Fork Creek	Yes	No
93	SR1005	Mill Branch	Yes	No
95	SR1005	Grissett Creek	Yes	No
97	SR1173	Grissett Swamp	Yes	No
98	SR1173	Grissett Swamp	Yes	No
103	SR1314	Creek	Yes	No
112	SR1300	Creek	No	Yes
118	SR1317	Gum Swamp	Yes	No
141	SR1414	Canal	Yes	No
144	SR1429	Cedar Creek	No	Yes
161	SR1351	Gapway Swamp	Yes	No
167	SR1379	Gapway Swamp	Yes	No
175	SR1504	Dunn Swamp	Yes	No
178	SR1504	Dunn Swamp	Yes	Yes
196	SR1003	Green's Branch	Yes	No
198	SR1546	West Prong Swamp	Yes	No
201	SR1002	West Prong Swamp	Yes	No
216	SR1700	Welches Creek	Yes	Yes
222	SR1700	Red Hill Swamp	Yes	No
226	SR1700	Red Hill Swamp	Yes	No
228	SR1700	Red Hill Swamp	Yes	No
230	SR1700	Red Hill Swamp	Yes	No

Table 5: Deficient Bridges (cont'd)

Map Index	Route	Across	Structurally Deficient	Functionally Obsolete
232	SR1721	Creek	Yes	No
233	SR1001	Slades Swamp	Yes	Yes
235	SR1722	Welches Creek	Yes	No
245	SR1740	Slap Swamp	Yes	No
250	SR1800	Branch Friar Swamp	Yes	No
262	SR1836	Dan's Creek	Yes	No
269	SR1849	Big Branch	Yes	No
274	SR1824	Big Branch	Yes	No
275	SR1824	Livingston Creek	Yes	No
278	SR1824	Livingston Creek	Yes	No
279	SR1831	Livingston Creek	Yes	No
280	SR1843	Dan's Creek	Yes	No
281	SR1843	Dan's Creek	Yes	No
289	SR1141	Grissett Swamp	Yes	No
290	SR1141	Grissett Swamp	Yes	No
291	SR1141	Grissett Swamp	Yes	No
294	SR1141	Grissett Swamp	Yes	No
301	SR1005	Branch of Tom's Creek	Yes	No
320	SR1118	Juniper Swamp	Yes	No

FIGURE 4

DEFICIENT
BRIDGES

Columbus County
NORTH CAROLINA

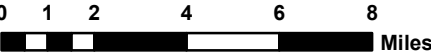
LEGEND

- ▲ Functionally Obsolete
- Structurally Deficient
- City Boundary
- Urban Planning Area

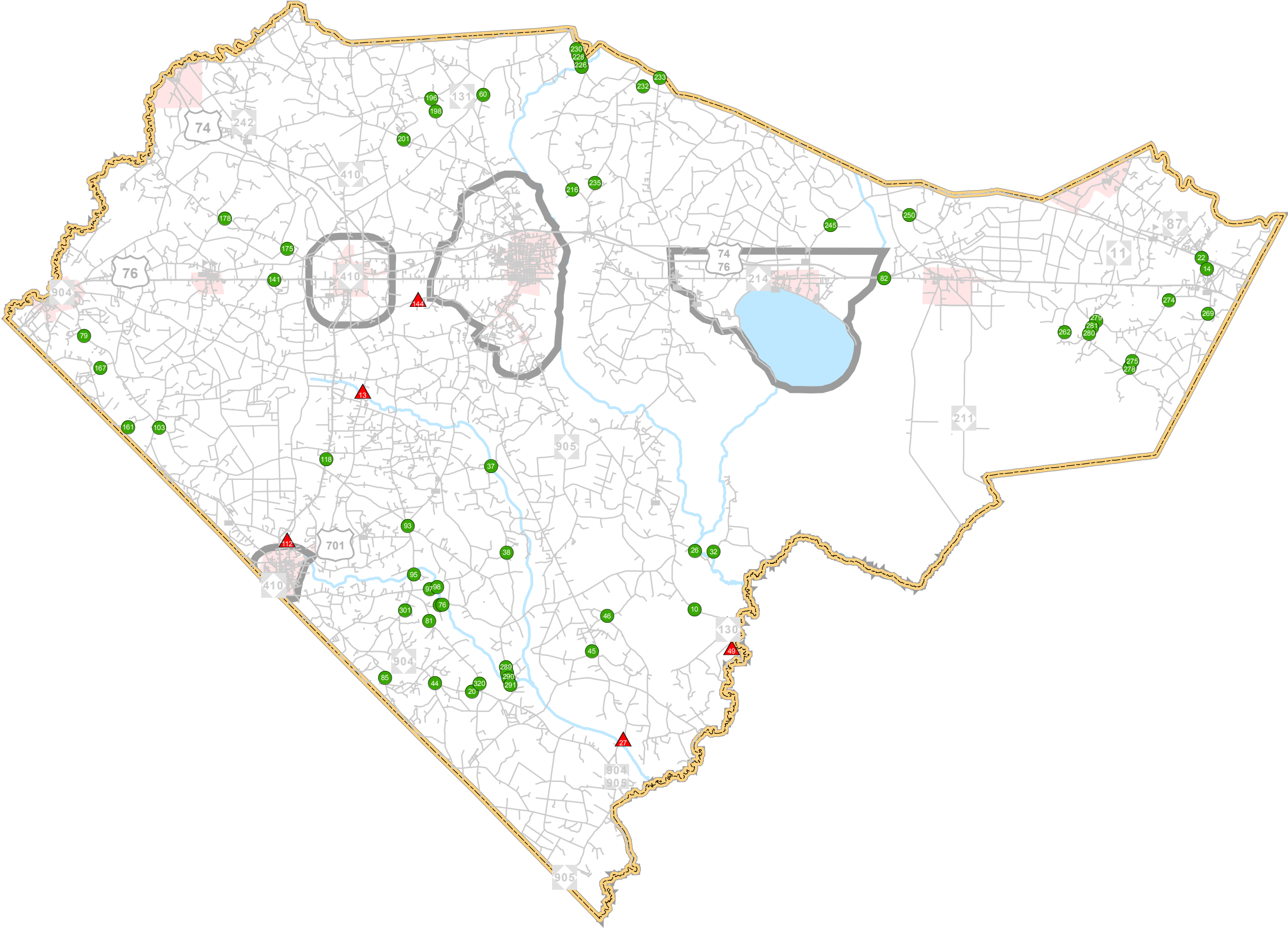
COUNTY OF
COLUMBUS

NORTH CAROLINA

PREPARED BY THE
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TRANSPORTATION PLANNING BRANCH
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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION



BASE MAP DATE: APRIL 30, 2005



Roadway Capacity Deficiencies

Capacity deficiencies occur when the traffic volume of a roadway is eighty percent or more of roadway's capacity. Travel volumes are based on the total number of vehicles that use a roadway on a typical day. These volumes are based on annual average daily traffic (AADT) counts taken annually by the NCDOT Traffic Survey Group.

Capacity is the maximum number of vehicles which have a "reasonable expectation" of passing over a given section of roadway, during a given time period under prevailing roadway and traffic conditions. Many factors contribute to the capacity of a roadway including the following:

- Geometry of the road, including number of lanes, horizontal and vertical alignment, and proximity of perceived obstructions to safe travel along the road;
- Typical users of the road, such as commuters, recreational travelers, and truck traffic;
- Access control, including streets and driveways, or lack thereof, along the roadway;
- Development of the road, including residential, commercial, agricultural, and industrial developments;
- Number of traffic signals along the route;
- Peaking characteristics of the traffic on the road;
- Characteristics of side-roads feeding into the road; and
- Directional split of traffic or the percentages of vehicles traveling in each direction along a road at any given time.

2005 Traffic Capacity Analysis

A comparison of the 2005 travel demand volumes for the major roadways in the planning area and their respective capacities identified several existing deficiencies for the Columbus County planning area. These existing roadway deficiencies are summarized in Table 6 and shown in Figure 5.

2030 Traffic Capacity Analysis

The capacity deficiency analysis for the 2030 design year is based upon a "no build" scenario. This analysis revealed several roadways within the planning area will exceed capacity by the design year. Table 7 and Figure 6 present the capacity deficiencies for the design year. Complete recommendations for these facilities are included in Chapter 2 of this report.

Table 6: 2005 Capacity Deficiencies	
Roadway/Section	Deficiency
NC 87 From SR 1859 to the Railroad crossing	Approaching capacity
US 74/76 Bus From SR 1708 to US 74/76	Over capacity

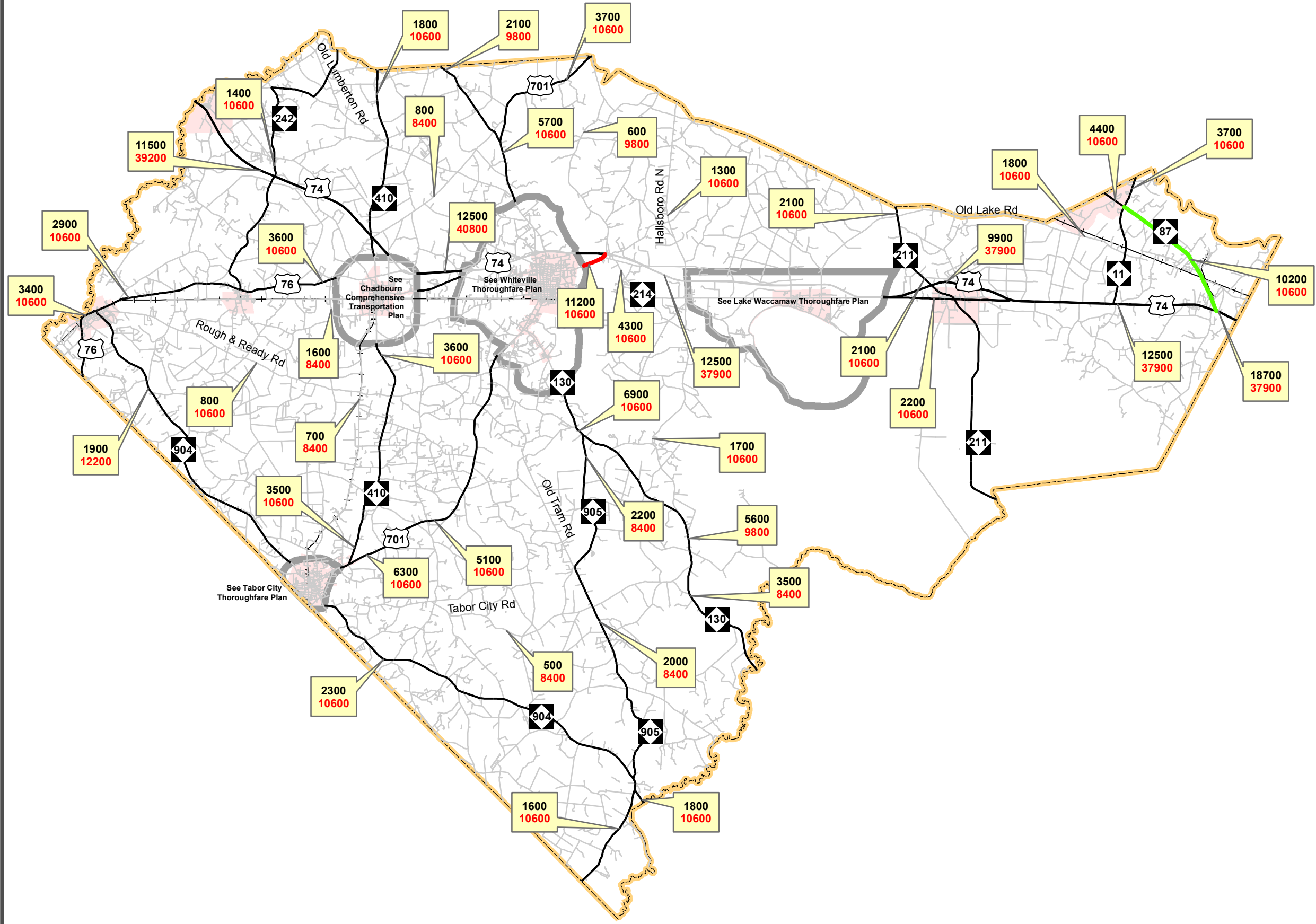
Table 7: 2030 Capacity Deficiencies	
Roadway/Section	Deficiency
US 74/76 From NC 87 to Old NC 87 (SR 1878)	Approaching capacity
NC 87 From NC 11 to Hammond Grove Lane (SR 1811) From Cornwallis Road (SR 1859) to the Railroad crossing	Over capacity Over capacity
US 701 From NC 131 to Hooks Road (SR 1546) From Vinegar Hill Road (SR 1312) to NC 410	Approaching capacity Approaching capacity
NC 130 From Ford Road (SR 1157) to NC 905 From Snake Island Road (SR 1927) to Juniper Creek Road (SR 1928)	Over capacity Approaching capacity
US 74/76 Bus From Old Tram Road (SR 1706) to US 74/76	Over capacity

FIGURE 5
2005 VOLUMES
AND
ROADWAY
DEFICIENCIES

Columbus County
Comprehensive
Transportation Plan

LEGEND

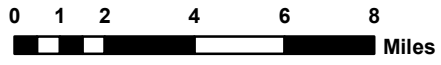
- COUNTY BOUNDARY
- NETWORK ROADS
- LOCAL ROADS
- OVER CAPACITY
- NEAR CAPACITY
- CITY BOUNDARY
- EXISTING PLANNING AREAS
- BODIES OF WATER
- RAILROADS
- 0000 2005 AADT
- 0000 CURRENT ROADWAY CAPACITY



COUNTY OF
COLUMBUS

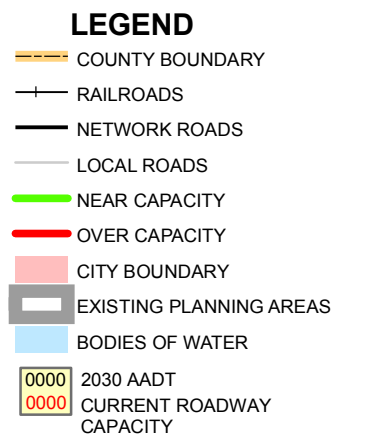
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FEDERAL HIGHWAY ADMINISTRATION



BASE MAP DATE: APRIL 30, 2005

Columbus County Comprehensive Transportation Plan



PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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BASE MAP DATE: APRIL 30, 2005

Level of Service (LOS)

The relationship of travel demand compared to the roadway capacity determines the level of service (LOS) of a roadway. Six levels of service identify the range of possible conditions. Designations range from LOS A, which represents the best operating conditions, to LOS F, which represents the worst operating conditions.

Design requirements for roadways vary according to the desired capacity and level of service. LOS D indicates “practical capacity” of a roadway, or the capacity at which the public begins to express dissatisfaction. Recommended improvements and overall design of the transportation plan were based upon achieving a minimum LOS D on existing facilities and a LOS C on new facilities. The six levels of service are described below and illustrated in Figure 7.

- **LOS A**: Describes primarily free flow conditions. The motorist experiences a high level of physical and psychological comfort. The effects of minor incidents of breakdown are easily absorbed. Even at the maximum density, the average spacing between vehicles is about 528 ft, or 26 car lengths.
- **LOS B**: Represents reasonably free flow conditions. The ability to maneuver within the traffic stream is only slightly restricted. The lowest average spacing between vehicles is about 330 ft, or 18 car lengths.
- **LOS C**: Provides for stable operations, but flows approach the range in which small increases will cause substantial deterioration in service. Freedom to maneuver is noticeably restricted. Minor incidents may still be absorbed, but the local decline in service will be great. Queues may be expected to form behind any significant blockage. Minimum average spacing is in the range of 220 ft, or 11 car lengths.
- **LOS D**: Borders on unstable flow. Density begins to deteriorate somewhat more quickly with increasing flow. Small increases in flow can cause substantial deterioration in service. Freedom to maneuver is severely limited, and the driver experiences drastically reduced comfort levels. Minor incidents can be expected to create substantial queuing. At the limit, vehicles are spaced at about 165 ft, or 9 car lengths.
- **LOS E**: Describes operation at capacity. Operations at this level are extremely unstable, because there are virtually no usable gaps in the traffic stream. Any disruption to the traffic stream, such as a vehicle entering from a ramp, or changing lanes, requires the following vehicles to give way to admit the vehicle. This can establish a disruption wave that propagates through the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce a serious breakdown with extensive queuing. Vehicles are spaced at approximately 6 car lengths, leaving little room to maneuver.
- **LOS F**: Describes forced or breakdown flow. Such conditions generally exist within queues forming behind breakdown points.

Figure 7
LEVEL OF SERVICE ILLUSTRATIONS

Level of Service A



Driver Comfort: High

Maximum Density:

12 passenger cars per mile per lane

Level of Service B



Driver Comfort: High

Maximum Density:

20 passenger cars per mile per lane

Level of Service C



Driver Comfort: Some Tension

Maximum Density:

30 passenger cars per mile per lane

Level of Service D



Driver Comfort: Poor

Maximum Density:

42 passenger cars per mile per lane

Level of Service E



Driver Comfort: Extremely Poor

Maximum Density:

67 passenger cars per mile per lane

Level of Service F



Driver Comfort: The lowest

Maximum Density:

More than 67 passenger cars per mile per lane

Source: 2000 Highway Capacity Manual

V. Environmental Screening

In recent years, the environmental considerations associated with transportation construction have come to the forefront of the planning process. Section 102 of the National Environmental Policy Act (NEPA) requires the completion of an Environmental Impact Statement (EIS) for projects that have a significant impact on the environment. The EIS includes impacts on wetlands, wildlife, water quality, historic properties, and public lands. While this report does not cover the environmental concerns in as much detail as an EIS would, consideration for many of these factors was incorporated into the development of the transportation plan. These factors were also incorporated into the recommended improvements. Environmental features found in the area are shown in Figure 8 (Sheets 1-4).

Wetlands

Wetlands are those lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands are crucial ecosystems in our environment. They help regulate and maintain the hydrology of our rivers, lakes, and streams by storing and slowly releasing floodwaters. Wetlands help maintain the quality of water by storing nutrients, reducing sediment loads, and reducing erosion. They are also critical to fish and wildlife populations by providing an important habitat for approximately one-third of the plant and animal species that are federally listed as threatened or endangered.

The National Wetland Inventory showed several wetlands throughout the study area. Wetland impacts have been avoided or minimized to the greatest extent possible while preserving the integrity of the transportation plan.

Threatened and Endangered Species

The Threatened and Endangered Species Act of 1973 allows the U.S. Fish and Wildlife Service to impose measures on the Department of Transportation to mitigate the environmental impacts of a transportation project on endangered animal and plant species, as well as critical wildlife habitats. Locating any rare species that exist within the planning area during this early planning stage will help to avoid or minimize impacts.

A preliminary review of the Federally Listed Threatened and Endangered Species in the area was completed to determine what effects, if any, the recommended improvements may have on wildlife. Mapping from the N.C. Department of Environment and Natural Resources revealed occurrences of threatened or endangered plant and/or animal species in the area which are summarized in Table 8. No threatened or endangered species are anticipated to be adversely impacted by any of the transportation plan

recommendations. However, a detailed field investigation is recommended prior to construction of any highway project in this area.

Table 8: Threatened or Endangered Species				
Species	Common Name	Major Group	Status	
			NC	Federal
<i>Elliptio waccamawensis</i>	Waccamaw Spike	Mollusk	E	FSC
<i>Lampsilis cariosa</i>	Yellow Lampmussel	Mollusk	E	FSC
<i>Lampsilis fullerkati</i>	Waccamaw Fatmucket	Mollusk	T	FSC
<i>Toxolasma pullus</i>	Savannah Lilliput	Mollusk	E	FSC
<i>Triodopsis soelneri</i>	Cape Fear Threetooth	Mollusk	T	FSC
<i>Picoides borealis</i>	Red-cockaded Woodpecker	Bird	E	E
<i>Aimophila aestivalis</i>	Bachman's Sparrow	Bird	SC	FSC
<i>Acipenser brevirostrum</i>	Shortnose Sturgeon	Fish	E	E
<i>Noturus</i> sp. 1	Broadtail Madtom	Fish	SC	FSC
<i>Fundulus waccamensis</i>	Waccamaw Killifish	Fish	SC	FSC
<i>Menidia extensa</i>	Waccamaw Silverside	Fish	T	T
<i>Elassoma boehlkei</i>	Carolina Pygmy Sunfish	Fish	T	FSC
<i>Etheostoma perlongum</i>	Waccamaw Darter	Fish	T	FSC
<i>Myotis austroriparius</i>	Southeastern Myotis	Mammal	SC	FSC
<i>Corynorhinus rafinesquii macrotis</i>	Rafinesque's Big-eared Bat	Mammal	T	FSC
<i>Alligator mississippiensis</i>	American Alligator	Reptile	T	T(S/A)
<i>Ophisaurus mimicus</i>	Mimic Glass Lizard	Reptile	SC	FSC
<i>Solidago verna</i>	Spring-flowering Goldenrod	Vascular Plant	T	FSC
<i>Dionaea muscipula</i>	Venus Flytrap	Vascular Plant	SR-L, SC	FSC
<i>Macbridea caroliniana</i>	Carolina Bogmint	Vascular Plant	T	FSC
<i>Ludwigia ravenii</i>	Raven's Seedbox	Vascular Plant	SR-T	FSC
<i>Plantago sparsiflora</i>	Pineland Plantain	Vascular Plant	E	FSC
<i>Lysimachia asperulifolia</i>	Rough-leaf Loosestrife	Vascular Plant	E	E
<i>Thalictrum cooleyi</i>	Cooley's Meadowrue	Vascular Plant	E	E
<i>Parnassia caroliniana</i>	Carolina Grass-of-parnassus	Vascular Plant	E	FSC
<i>Parnassia grandifolia</i>	Large-leaved Grass-of-parnassus	Vascular Plant	T	FSC
<i>Sagittaria weatherbiana</i>	Grassleaf Arrowhead	Vascular Plant	SR-T	FSC
<i>Fimbristylis perpusilla</i>	Harper's Fimbry	Vascular Plant	T	FSC
<i>Rhynchospora decurrens</i>	Swamp Forest Beakrush	Vascular Plant	SR-P	FSC
<i>Sporobolus teretifolius sensu stricto</i>	Wireleaf Dropseed	Vascular Plant	T	FSC
<i>Anguilla Rostrata</i>	American Eel	Fish	FSC	FSC
<i>Haliaeetus Leucocephalus</i>	Bald Eagle	Bird	T	T
<i>Ammodramus Henslowii Susurrans</i>	Eastern Henslow's Sparrow	Bird	FSC	FSC
<i>Mycteria Americana</i>	Wood Stork	Bird	E	E
<i>Stylurus Townesi</i>	Bronze Clubtail Dragonfly	Insect	FSC	FSC
<i>Amorpha Georgiana</i>	Carolina lead-plant	Vascular Plant	FSC	FSC

Refer to Appendix E for definitions of environmental status codes.

Historic Sites

Section 106 of the National Historic Preservation Act requires the Department of Transportation to identify historic properties listed in, as well as eligible for, the National Register of Historic Places (NRHP). The NCDOT must consider the impacts of transportation projects on these properties and consult with the Federal Advisory Council on Historic Preservation.

N.C. General Statute 121-12(a) requires the NCDOT to identify historic properties listed on the National Register, but not necessarily those that are eligible to be listed. The NCDOT must consider the impacts and consult with the State Historic Preservation Office (SHPO), but is not bound by their recommendations.

















The location of historic sites within the planning area was investigated to determine any possible impacts resulting from the recommended improvements. This investigation identified three registered historic properties (The Clarkton Depot, John Hector Clark House, and Powell House). None of these historic properties will be impacted by the recommended improvements.

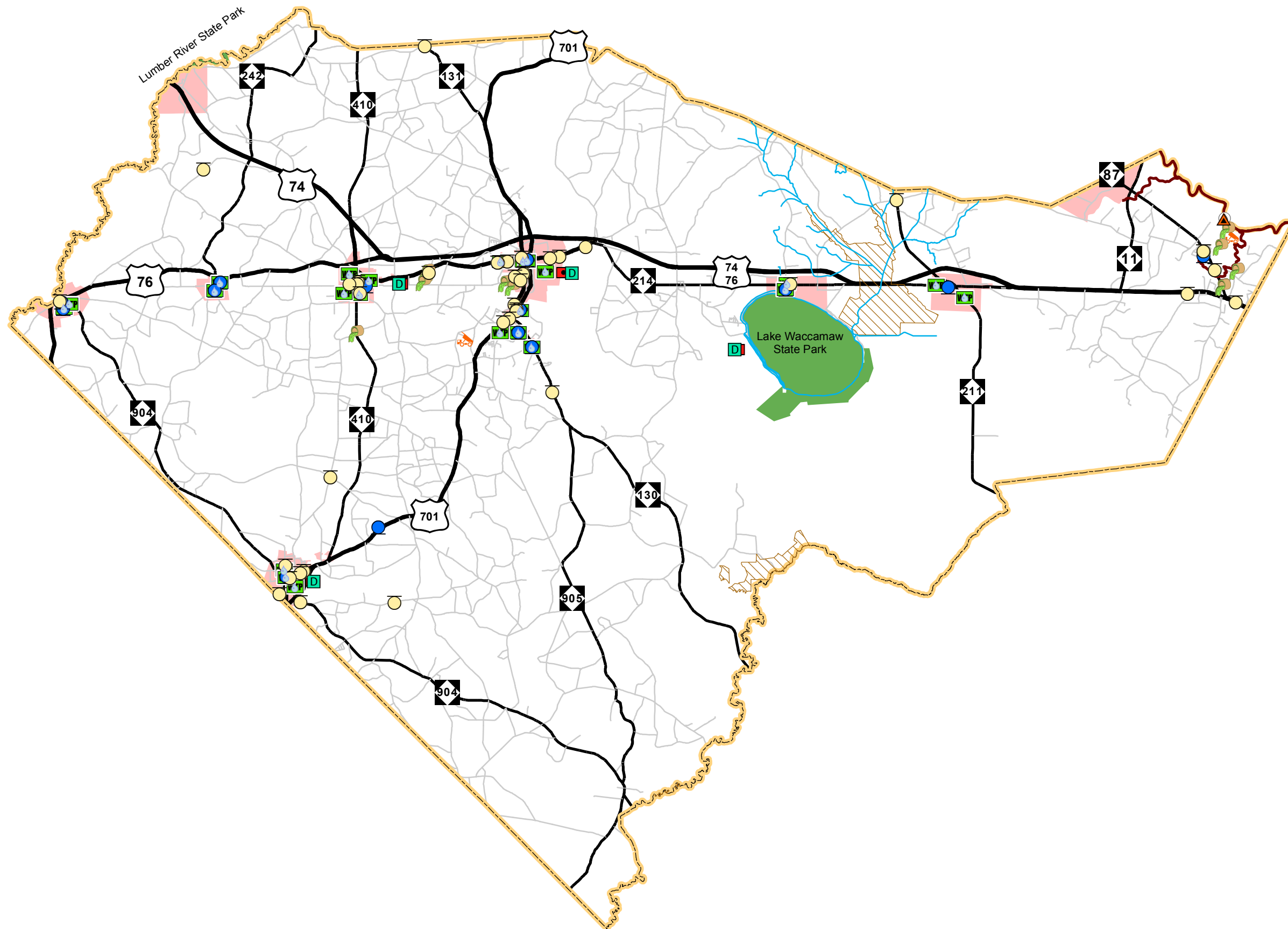
Educational Facilities

The location of educational facilities in the study area was considered during the development of the transportation plan and are depicted in Figure 8 (Sheet 2). The implementation of the transportation plan should result in positive effects on educational facilities in the study area by improving the safety and capacity of the roadways around educational facilities, and avoiding existing schools.

FIGURE 8 - Sheet 1
**ENVIRONMENTAL
 FEATURES**

LEGEND

-  Ground Water Intake
-  Underground Storage Tank
-  Hazardous Waste Site
-  Sewer Discharge
-  Sewer Treatment Plant
-  Water Storage Tank
-  Water Treatment Plant
-  Hazardous Disposal Site
-  Solid Waste
-  Surface Water Intake
-  Aquatic Endangered Species
-  Anadromous Fish Spawning Area
-  Gamelands
-  State Park
-  Columbus County
-  Municipal Boundaries

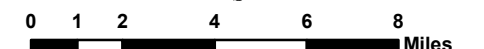


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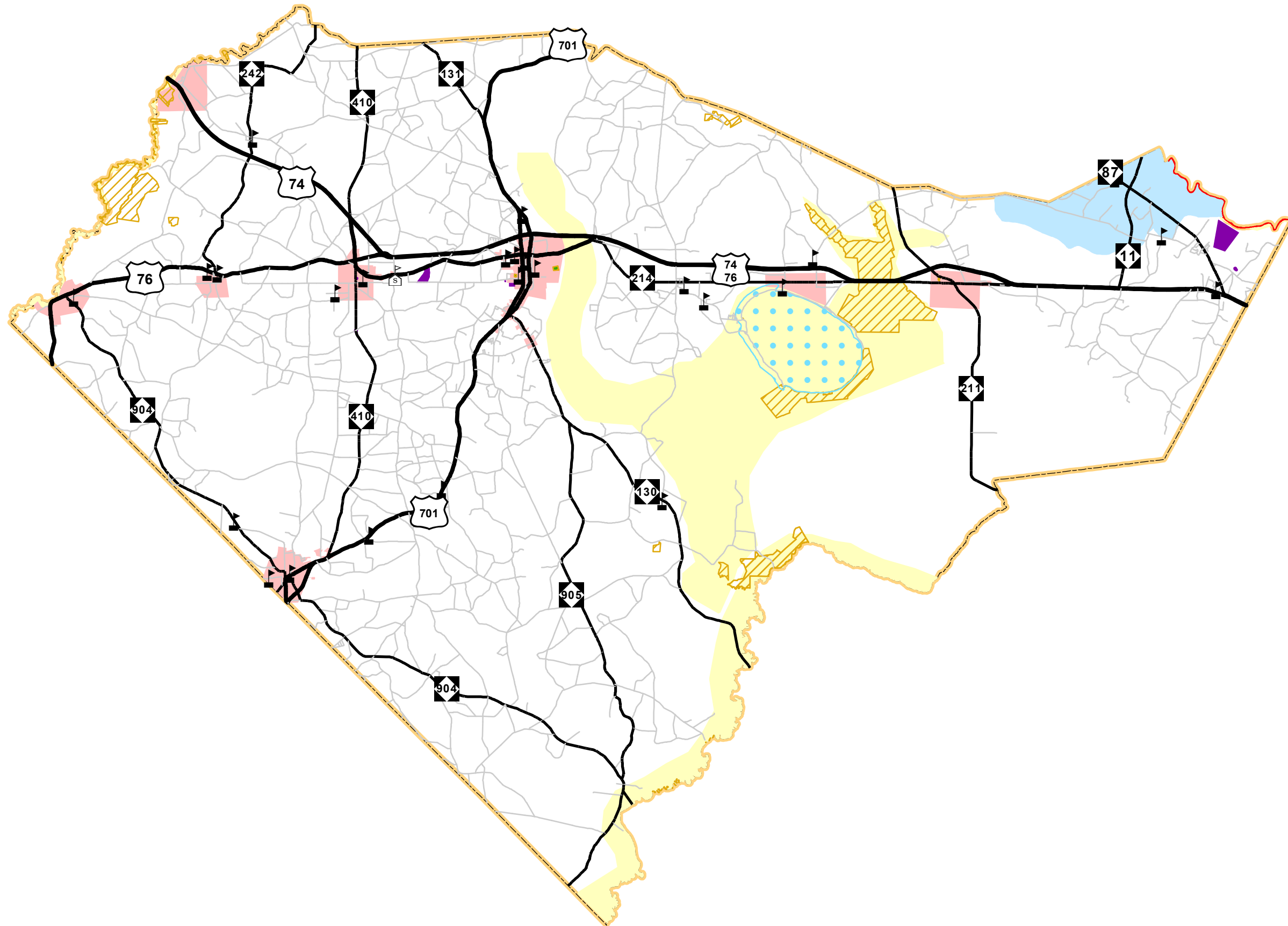
BASE MAP DATE: APRIL 2006

FIGURE 8 - Sheet 2

ENVIRONMENTAL FEATURES

LEGEND

-  Community Colleges
-  Public School
-  Land Trust Area
-  Water Supply Watershed
-  Recreation Projects
-  Managed Conservation Lands
-  High Quality Water Resource
-  Hazardous Disposal Site
-  Fish Nursery Area
-  Columbus County
-  Municipal Boundaries

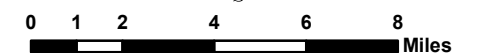


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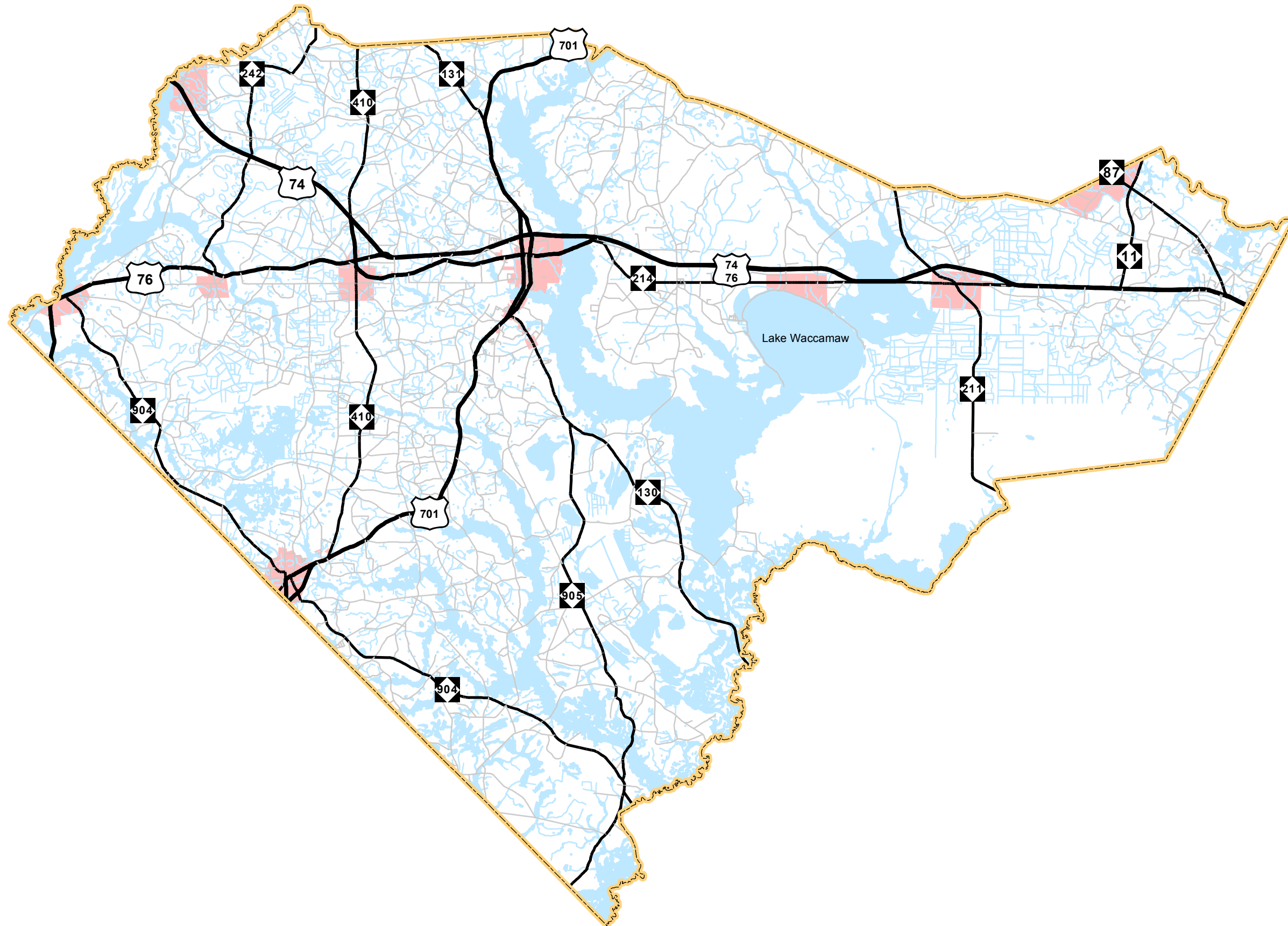
BASE MAP DATE: APRIL 2006

FIGURE 8 - Sheet 3

ENVIRONMENTAL FEATURES

LEGEND

- Surface Water (rivers and streams)
- Surface Water (lakes and ponds)
- Columbus County
- Municipal Boundaries



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0 1 2 4 6 8 Miles

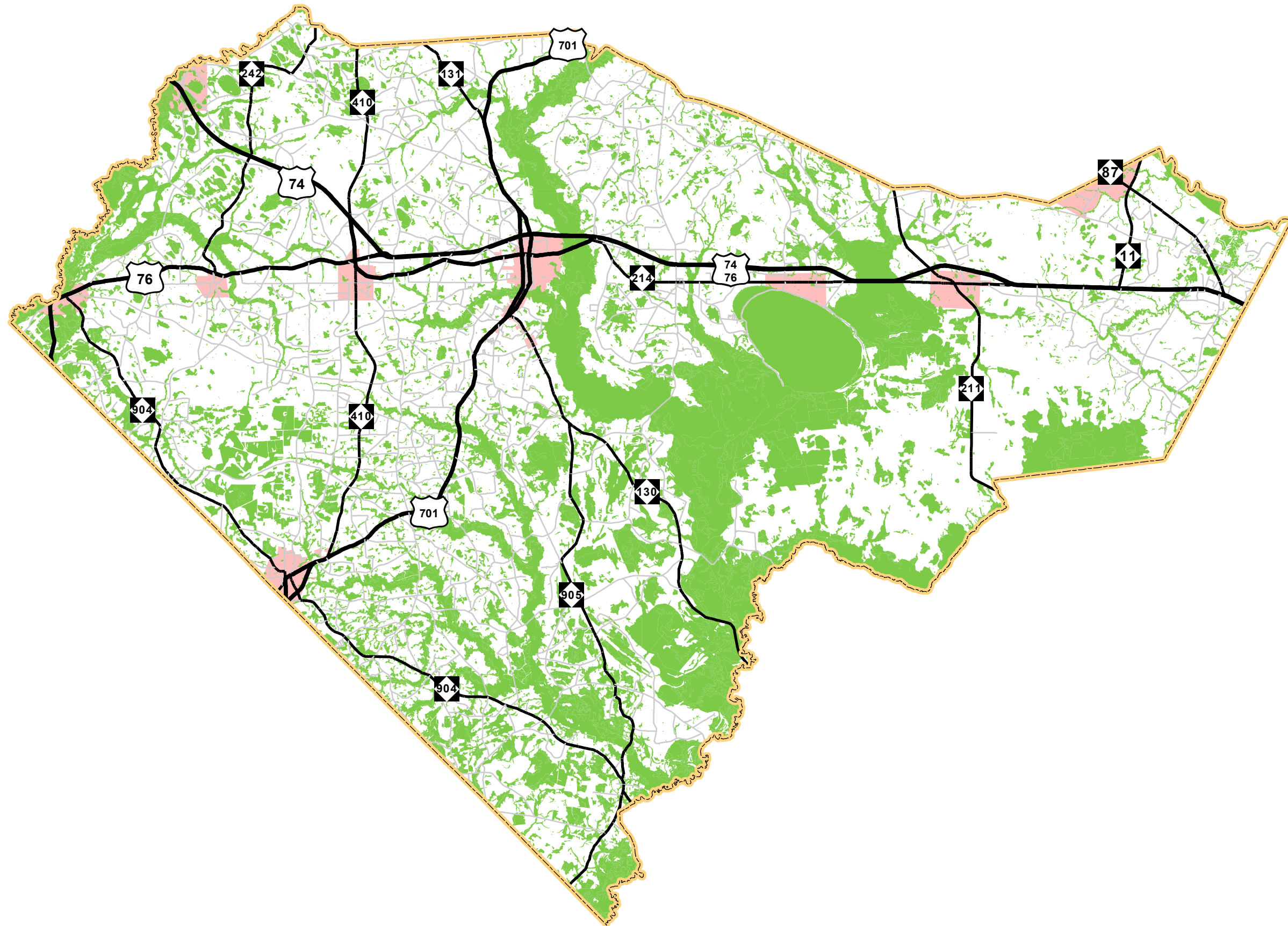
BASE MAP DATE: APRIL 2006

FIGURE 8 - Sheet 4

ENVIRONMENTAL FEATURES

LEGEND

-  National Wetland Inventory
-  Municipal Boundaries
-  Columbus County



COUNTY OF COLUMBUS

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0 1 2 4 6 8 Miles

BASE MAP DATE: APRIL 2006

VI. Public Involvement

Since the passage of the federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the emphasis on public involvement in transportation has taken on a new role. Although public participation has been an element of long range transportation planning in the past, these regulations call for a much more proactive approach. The NCDOT's Transportation Planning Branch has a long history of making public involvement a key element in the development of any long-range transportation plan, regardless the size of the planning area. This chapter is designed to provide an overview of the public involvement elements implemented into the development of the transportation plan for Columbus County.

In July 2002, the Columbus County Board of Commissioners requested the NCDOT complete a long-range transportation plan for the county. A meeting was held with the Columbus County Board of Commissioners on April 18, 2005 to formally initiate the study, provide an overview of the transportation planning process, and to gather input on their transportation needs.

Throughout the course of the study, the Transportation Planning Branch met with the county staff to provide plan information, to discuss population and employment projections, and to discuss the proposed recommendations. An additional meeting was held with the Planning Board to develop a vision for future land use.

Three public drop-in sessions were held in Columbus County to present the proposed Comprehensive Transportation Plan to the public. The first meeting was held on August 21, 2006 from 5-7pm in the Lake Waccamaw Town Hall. The second meeting was held on August 22, 2006 from 5-7pm in the Chadbourn Town Hall. The last public drop-in session was held in the Tabor City Visitors Center from 5-7pm on August 24, 2006. No comments were submitted at any of the public drop-in sessions.

A public hearing was held on October 2, 2006 during the Columbus County Board of Commissioners meeting. The purpose of this meeting was to discuss the plan recommendations and to solicit further input from the public. Two citizens voiced their concerns at this meeting. Due to these concerns, the Transportation Planning Branch met twice with the Board of Commissioners before unanimous adoption of the plan on January 16, 2007.

The Cape Fear RPO voted unanimously to endorse the CTP on March 16, 2007. The North Carolina Board of Transportation voted to mutually adopt the Columbus County CTP on May 3, 2007.

APPENDIX A

Resources and NCDOT Contacts

North Carolina Department of Transportation

Customer Service Office
1-877-DOT4YOU
(1-877-368-4968)

Secretary of Transportation
1501 Mail Service Center
Raleigh, NC 27699-1501
(919) 733-2520

Board of Transportation Member

Current contact information for the Board of Transportation may be accessed from the NCDOT homepage (<http://apps01.dot.state.nc.us/apps/directory/30.html>)
Or by calling the Customer Service Office.

Highway Division Engineers

Division specific contact information can be found at
<http://apps01.dot.state.nc.us/apps/directory/toc.html>

Contact Whom, When?

Division Engineer

Contact the Division Engineer with general questions concerning NCDOT activities within each Division; information on Small Urban Funds.

Division Construction Engineer

Contact the Division Construction Engineer for information concerning major roadway improvements under construction.

Division Traffic Engineer

Contact the Division Traffic Engineer for information concerning high- collision locations.

District Engineer

Contact the District Engineer for information regarding Driveway Permits, Right of Way, Encroachments, and Development Reviews.

County Maintenance Engineer

Contact the County Maintenance Engineer regarding any maintenance activities, such as drainage.

Transportation Planning Branch (TPB)

Contact the Transportation Planning Branch with long-range planning questions.

1554 Mail Service Center
Raleigh, NC 27699-1554
(919) 733-4705

<http://apps01.dot.state.nc.us/apps/directory/3234.html>

Secondary Roads Office

Contact the Secondary Roads Office for information regarding the Industrial Access Funds Program.

P.O. Box 25201

Raleigh, NC 27699

(919) 733-2039

<http://apps01.dot.state.nc.us/apps/directory/135.html>

Program Development Branch

Contact the Program Development Branch for information concerning Roadway Official Corridor Maps and the Transportation Improvement Program (TIP).

1534 Mail Service Center

Raleigh, NC 27699-1534

(919) 733-2039

<http://apps01.dot.state.nc.us/apps/directory/632.html>

Project Development & Environmental Branch (PDEA)

Contact PDEA for information on environmental studies for projects that are included in the TIP.

1548 Mail Service Center

Raleigh, NC 27699-1548

(919) 733-3141

<http://apps01.dot.state.nc.us/apps/directory/3212.html>

Highway Design Branch

Contact the Highway Design Branch for information regarding alignment for projects that are included in the TIP.

1584 Mail Service Center

Raleigh, NC 27699-1584

(919) 250-4001

<http://apps01.dot.state.nc.us/apps/directory/659.html>

Public Transportation Division

Contact the Public Transportation Division for information public transit systems.

1550 Mail Service Center

Raleigh, NC 27699-1550

(919) 733-4713

<http://apps01.dot.state.nc.us/apps/directory/3366.html>

Other NCDOT Departments

Contact information for other departments within the NCDOT not listed here are available by calling the Customer Service Office or by visiting the NCDOT homepage at <http://apps01.dot.state.nc.us/apps/directory/toc.html>.

Other State Government Offices

Division of Community Assistance

Contact the Division of Community Assistance for information regarding the Community Planning Program. You may find their contact information at:

<http://www.dca.commerce.state.nc.us>

Division 6, District 3 Contacts (Columbus County)

Board Member

Mr. D.M. Campbell, Jr.
PO Box 39
Elizabethtown, NC 28337
(910) 862-8423
dmcamp@bizec.rr.com

Division Engineer

Mr. Terry R. Gibson
558 Gillespie St.
Fayetteville, NC 28301
(910) 486-1493
tgibson@dot.state.nc.us

Division Maintenance Engineer

Mr. Ken Murphy, Jr, PE
558 Gillespie St.
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(910) 486-1493
rkmurphy@dot.state.nc.us

Transportation Planning Manager

Mr. Mike Bruff, PE
1554 Mail Service Center
Raleigh, NC 27699-1554
(919) 733-4705

Secondary Roads Manager

Mr. Delbert Roddenberry
1535 Mail Service Center
Raleigh, NC 27699-1535
(919) 733-4705
jrand@dot.state.nc.us

RPO Contact

Mr. Don Eggert
1480 Harbour Drive
Wilmington, NC 28401
(910) 395-4553
deggert@capefearcog.org

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Mr. H.L. "Drew" Cox, PE
1194 Prison Camp Road
Whiteville, NC 28472
(910) 642-3760
hlcox@dot.state.nc.us

Division Project Manager

Mr. Jerry Bradley
558 Gillespie St.
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jbradley@dot.state.nc.us

Division Construction Engineer

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Fayetteville, NC 28301
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tpittman@dot.state.nc.us

Southeast Group Supervisor

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1554 Mail Service Center
Raleigh, NC 27699-1554
(919) 733-4705

NCDOT RPO Coordinator

Mr. Tyler Bray, EIT
1554 Mail Service Center
Raleigh, NC 27699-1554
(919) 733-4705
tbray@dot.state.nc.us

Division Traffic Engineer

Mr. W.L. "Lee" Jernigan, Jr., PE
558 Gillespie St.
Fayetteville, NC 28301
(910) 486-1493

APPENDIX B

Comprehensive Transportation Plan Definitions

Definitions for CTP Maps

Highway Map

- **Freeways¹**
 - Functional purpose – high mobility, high volume, high speed
 - Posted speed – 55 mph or greater
 - Cross section – minimum four lanes with continuous median
 - Multi-modal elements – High Occupancy Vehicles (HOV)/High Occupancy Transit (HOT) lanes, busways, truck lanes, park-and-ride facilities at/near interchanges, adjacent shared use paths (separate from roadway and outside ROW)
 - Type of access control – full control of access
 - Access management – interchange spacing (urban – one mile; non-urban – three miles); at interchanges on the intersecting roadway, full control of access for 1,000' or for 350' plus 650' island or median; use of frontage roads, rear service roads
 - Intersecting facilities – interchange or grade separation (no signals or at-grade intersections)
 - Driveways – not allowed
- **Expressways¹**
 - Functional purpose – high mobility, high volume, medium-high speed
 - Posted speed – 45 to 60 mph
 - Cross section – minimum four lanes with median
 - Multi-modal elements – HOV lanes, busways, very wide paved shoulders (rural), shared use paths (separate from roadway but within ROW)
 - Type of access control – limited or partial control of access;
 - Access management – minimum interchange/intersection spacing 2,000 feet; median breaks only at intersections with minor roadways or to permit U-turns; use of frontage roads, rear service roads; driveways limited in location and number; use of acceleration/deceleration or right turning lanes
 - Intersecting facilities – interchange; at-grade intersection for minor roadways; right-in/right-out and/or left-over or grade separation (no signalization for through traffic)
 - Driveways – right-in/right-out only; direct driveway access via service roads or other alternate connections
- **Boulevards**
 - Functional purpose – moderate mobility; moderate access, moderate volume, medium speed
 - Posted speed – 30 to 55 mph
 - Cross section – two or more lanes with median (median breaks allowed for U-turns per current NCDOT *Driveway Manual*)
 - Multi-modal elements – bus stops, bike lanes (urban) or wide paved shoulders (rural), sidewalks (urban - local government option)
 - Type of access control – limited control of access, partial control of access, or no control of access
 - Access management – two lane facilities may have medians with crossovers, medians with turning pockets or turning lanes; use of acceleration/deceleration or right turning lanes is optional; for abutting properties, use of shared driveways,

- internal out parcel access and cross-connectivity between adjacent properties is strongly encouraged
- Intersecting facilities – at grade intersections and driveways; interchanges at special locations with high volumes
- Driveways – primarily right-in/right-out, some right-in/right-out in combination with median leftovers; major driveways may be full movement when access is not possible using an alternate roadway
- Other Major Thoroughfares
 - Functional purpose – balanced mobility and access, moderate volume, low to medium speed
 - Posted speed – 25 to 55 mph
 - Cross section – four or more lanes without median
 - Multi-modal elements – bus stops, bike lanes/wide outer lane (urban) or wide paved shoulder (rural), sidewalks (urban)
 - Type of access control – no control of access
 - Access management – continuous left turn lanes; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is strongly encouraged
 - Intersecting facilities – intersections and driveways
 - Driveways – full movement on two lane roadway with center turn lane as permitted by the current NCDOT *Driveway Manual*
- Minor Thoroughfares
 - Functional purpose – balanced mobility and access, moderate volume, low to medium speed
 - Posted speed – 25 to 45 mph
 - Cross section – ultimately three lanes (no more than one lane per direction) or less without median
 - Multi-modal elements – bus stops, bike lanes/wide outer lane (urban) or wide paved shoulder (rural), sidewalks (urban)
 - ROW – no control of access
 - Access management – continuous left turn lanes; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is strongly encouraged
 - Intersecting facilities – intersections and driveways
 - Driveways – full movement on two lane with center turn lane as permitted by the current NCDOT *Driveway Manual*
- Existing – Roadway facilities that are not recommended to be improved.
- Needs Improvement – Roadway facilities that need to be improved for capacity, safety, or system continuity. The improvement to the facility may be widening, other operational strategies, increasing the level of access control along the facility, or a combination of improvements and strategies. **“Needs improvement” does not refer to the maintenance needs of existing facilities.**
- Recommended – Roadway facilities on new location that are needed in the future.
- Interchange – Through movement on intersecting roads is separated by a structure. Turning movement area accommodated by on/off ramps and loops.
- Grade Separation – Through movement on intersecting roads is separated by a structure. There is no direct access between the facilities.

- ❑ Full Control of Access – Connections to a facility provided only via ramps at interchanges. No private driveway connections allowed.
- ❑ Limited Control of Access – Connections to a facility provided only via ramps at interchanges (major crossings) and at-grade intersections (minor crossings and service roads). No private driveway connections allowed.
- ❑ Partial Control of Access – Connections to a facility provided via ramps at interchanges, at-grade intersections, and private driveways. Private driveway connections shall be defined as a maximum of one connection per parcel. One connection is defined as one ingress and one egress point. These may be combined to form a two-way driveway (most common) or separated to allow for better traffic flow through the parcel. The use of shared or consolidated connections is highly encouraged.
- ❑ No Control of Access – Connections to a facility provided via ramps at interchanges, at-grade intersections, and private driveways.

Public Transportation and Rail Map

- ❑ Bus Routes – The primary fixed route bus system for the area. Does not include demand response systems.
- ❑ Fixed Guideway – Any transit service that uses exclusive or controlled rights-of-way or rails, entirely or in part. The term includes heavy rail, commuter rail, light rail, monorail, trolleybus, aerial tramway, included plane, cable car, automated guideway transit, and ferryboats.
- ❑ Operational Strategies – Plans geared toward the non-single occupant vehicle. This includes but is not limited to HOV lanes or express bus service.
- ❑ Rail Corridor – Locations of railroad tracks that are either active or inactive tracks. These tracks were used for either freight or passenger service.
 - Active – rail service is currently provided in the corridor; may include freight and/or passenger service
 - Inactive – right of way exists; however, there is no service currently provided; tracks may or may not exist
 - Recommended – It is desirable for future rail to be considered to serve an area.
- ❑ High Speed Rail Corridor – Corridor designated by the U.S. Department of Transportation as a potential high speed rail corridor.
 - Existing – Corridor where high speed rail service is provided (there are currently no existing high speed corridor in North Carolina).
 - Recommended – Proposed corridor for high speed rail service.
- ❑ Rail Stop – A railroad station or stop along the railroad tracks.
- ❑ Intermodal Connector – A location where more than one mode of public transportation meet such as where light rail and a bus route come together in one location or a bus station.
- ❑ Park and Ride Lot – A strategically located parking lot that is free of charge to anyone who parks a vehicle and commutes by transit or in a carpool.

Bicycle Map

- ❑ On Road-Existing – Conditions for bicycling on the highway facility are adequate to safely accommodate cyclists.
- ❑ On Road-Needs Improvement – At the systems level, it is desirable for the highway facility to accommodate bicycle transportation; however, highway improvements are necessary to create safe travel conditions for the cyclists.

- ❑ On Road-Recommended – At the systems level, it is desirable for a recommended highway facility to accommodate bicycle transportation. The highway should be designed and built to safely accommodate cyclists.
- ❑ Off Road-Existing – A facility that accommodates bicycle transportation (may also accommodate pedestrians, eg. greenways) and is physically separated from a highway facility usually on a separate right-of-way.
- ❑ Off Road-Needs Improvement – A facility that accommodates bicycle transportation (may also accommodate pedestrians, eg. greenways) and is physically separated from a highway facility usually on a separate right-of-way that will not adequately serve future bicycle needs. Improvements may include but are not limited to: widening, paving (not re-paving), improved horizontal or vertical alignment.
- ❑ Off Road-Recommended – A facility needed to accommodate bicycle transportation (may also accommodate pedestrians, eg. greenways) and is physically separated from a highway facility usually on a separate right-of-way. This may also include greenway segments that do not necessarily serve a transportation function but intersect recommended facilities on the highway map or public transportation and rail map.

Pedestrian Map

Format for the pedestrian map is under development.

APPENDIX C

Comprehensive
Transportation
Plan
Tabulations
&
Recommendations

The appendix includes a detailed tabulation of all streets identified as elements of the Columbus County Comprehensive Transportation Plan. The table includes a description of the roads by sections, as well as the length, cross section, and right-of-way for each section. Also included is the existing and projected average daily traffic volumes, roadway capacity, and the recommended ultimate lane configuration. Due to space constraints, these recommended cross-sections are given in the form of an alphabetic code. A detailed description of each of these codes and an illustrative figure for each can be found in Appendix D.

The following index of terms may be helpful in interpreting the table:

SR – Secondary Route
N/A – Not Available
RDWY – Roadway
ROW – Right-of-way
ADQ – Adequate

Highway												
Facility and Segment		EXISTING CONDITIONS						AADT		RECOMMENDATIONS		
		Distance	Cross-Section		ROW	Speed Limit	Capacity	2005	2030	Capacity	Cross	ROW
From	To	(mi)	lanes	(ft)	(ft)	(mph)	(vpd)	AADT	AADT	(vpd)	Section	(ft)
I-74 (New Location)												
US 74	Brunswick County Line	12.11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	40800	A	250
I-20 (New Location)												
South Carolina State Line	Chadbourn Planning Area Boundary	11.73	n/a	n/a	n/a	n/a	n/a	n/a	n/a	40800	A	250
US 74												
Robeson County Line	Strawberry Boulevard (SR 1574)	6.67	4	56	150	55	39200	11500	23800	40800	A	250
Strawberry Boulevard (SR 1574)	NC 410	2.92	4	56	200	55	39200	10600	22200	40800	A	250
NC 410	Chadbourn Planning Boundary	1.00	4	56	225	55	39200	10300	21500	40800	A	250
Chadbourn Planning Boundary	Whiteville Planning Boundary	1.60	4	56	150	70	40800	10300	21500	40800	A	250
Whiteville Planning Boundary	US 74/76 Bus	1.10	4	56	150	70	40800	12500	20500	40800	A	250
US 74/76 Bus	Lake Waccamaw Planning Boundary	5.00	4	52	200	55	37900	13500	25200	40800	A	250
Lake Waccamaw Planning Boundary	Robinson Road (SR 1840)	6.90	4	52	200	55	37900	13500	25200	40800	A	250
Robinson Road (SR 1840)	US 74/76 Bus	2.79	4	50	80	55	37900	12500	20500	40800	A	250
US 74/76 Bus	NC 11	0.50	4	50	80	55	37900	12500	20500	ADQ	ADQ	ADQ
NC 11	Water Tank Road (SR 1824)	2.94	4	50	60	55	37900	12500	20500	ADQ	ADQ	ADQ
Water Tank Road (SR 1824)	Delco Cemetery Road (SR 1822)	0.57	4	50	60	55	37900	12500	20500	ADQ	ADQ	ADQ
Delco Cemetery Road (SR 1822)	Old NC 87 (SR 1878)	1.04	4	50	60	45	37900	11400	18800	ADQ	ADQ	ADQ
Old NC 87 (SR 1878)	Brunswick County Line	0.76	4	52	70	55	37900	18700	30700	ADQ	ADQ	ADQ
US 74/76 (New Location)												
US74/76 Bus	Brunswick County Line	6.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	40800	A	250
US 76												
South Carolina State Line	Fair Bluff City Limits	1.69	2	22	60	55	10600	3400	4300	10600	K	70
Fair Bluff City Limits	NC 904	1.16	2	22	60	35	10600	3400	4300	10600	K	70
NC 904	Hamer Street	0.67	2	36	60	20	8400	4700	6000	10600	K	70
Hamer Street	Fair Bluff City Limits	0.57	2	22	60	35	10600	4200	5000	10600	K	70
Fair Bluff City Limits	Cerro Gordo City Limits	5.15	2	22	60	55	10600	2900	3700	10600	K	70
Cerro Gordo City Limits	Cerro Gordo City Limits	0.79	3	36	100	45	10600	2900	3700	10600	H	ADQ
Cerro Gordo City Limits	Chadbourn Planning Boundary	5.01	2	24	100	55	10600	3600	4600	10600	K	ADQ
US 701												
Tabor City Planning Boundary	Whiteville Planning Boundary	14.90	2	26	150	55	10600	6300	10400	39500	F	ADQ
Whiteville Planning Boundary	Bladen County Line	7.23	2	26	150	55	10600	5700	9400	39500	F	ADQ
US 74 Bus												
Chadbourn Planning Area	Whiteville Planning Area	9.00	2	24	100	55	10600	6300	8100	40200	E	110
Whiteville Planning Area	US 74/76	0.90	2	24	100	55	10600	11200	14400	40200	E	110
NC 11												
US 74	NC 87	4.20	2	26	150	55	10600	1900	3800	10600	K	ADQ
NC 87	Bladen County Line	1.35	2	26	100	55	10600	3700	7800	10600	K	ADQ

Highway												
Facility and Segment		EXISTING CONDITIONS						AADT		RECOMMENDATIONS		
		Distance	Cross-Section		ROW	Speed Limit	Capacity	2005	2030	Capacity	Cross	ROW
From	To	(mi)	lanes	(ft)	(ft)	(mph)	(vpd)	AADT	AADT	(vpd)	Section	(ft)
NC 87												
US 74	Bladen County Line	7.02	2	28	100	55	10600	10200	13100	37800	A	250
NC 130												
Brunswick County Line	Old Dock Road (SR 1006)	5.76	2	24	100	55	10600	3500	5800	39500	F	130
Old Dock Road (SR 1006)	Whiteville Planning Boundary	11.73	2	24	60	55	10600	6900	11300	39500	F	130
NC 131												
US 701	Bladen County Line	4.18	2	20	100	55	9800	2100	2600	10600	K	ADQ
NC 211												
Brunswick County Line	NC 214	9.49	2	24	150	55	10600	2300	3800	10600	K	ADQ
NC 214	Bolton City Limits	1.02	2	28	150	55	10600	2300	3800	ADQ	ADQ	ADQ
Bolton City Limits	Bladen County Line	3.94	2	28	100	55	10600	2100	3400	ADQ	ADQ	ADQ
NC 214												
US 74/76 Bus	Elvira Road (SR 1758)	0.28	2	24	100	55	10600	4300	5500	10600	K	ADQ
Elvira Road (SR 1758)	Lake Waccamaw Planning Boundary	3.10	2	24	60	55	10600	4300	5500	10600	K	70
Lake Waccamaw Planning Boundary	Bolton City Limits	1.70	2	24	60	55	10600	2200	2700	10600	K	70
Bolton City Limits	Bolton City Limits	2.19	2	22	60	45	10600	2900	3700	10600	K	70
Bolton City Limits	US 74/76	1.17	2	40	80	55	10600	2900	3700	ADQ	ADQ	ADQ
NC 242												
US 76	Bladen County Line	13.59	2	24	60	55	10600	1400	1900	10600	K	70
NC 410												
US 701	Tabor City City Limits	0.38	2	26	100	35	10600	3500	5800	10600	K	ADQ
Tabor City City Limits	Chadbourn Planning Boundary	10.38	2	26	100	55	10600	3600	6000	10600	K	ADQ
Chadbourn Planning Boundary	Bird Cage Road (SR 1528)	1.25	2	20	100	55	9800	2700	4400	10600	K	ADQ
Bird Cage Road (SR 1528)	Klondike Road (SR 1572)	0.49	2	20	400	55	9800	2700	4400	10600	K	ADQ
Klondike Road (SR 1572)	Bladen County Line	7.03	2	20	100	55	9800	1800	2900	10600	K	ADQ
NC 904												
Robeson County Line	US 76	0.03	2	24	100	35	10600	2600	4300	10600	K	ADQ
US 76	Fair Bluff City Limits	0.88	2	44	60	35	10600	2400	3900	ADQ	ADQ	70
Fair Bluff City Limits	Hinsons Crossroads (SR 1356)	3.56	2	22	60	55	10600	1900	3100	10600	K	70
Hinsons Crossroads (SR 1356)	Tabor City Planning Area	10.10	2	24	100	55	10600	1700	2700	10600	K	ADQ
Tabor City Planning Area	Peacock Road (SR 1005)	4.00	2	24	100	55	10600	2300	3800	10600	K	ADQ
Peacock Road (SR 1005)	Norris Road (SR 1134)	2.07	2	24	60	55	10600	2200	3600	10600	K	70
Norris Road (SR 1134)	Ramsey Ford Road (SR 1108)	5.45	2	20	60	55	10600	2200	3600	10600	K	70
Ramsey Ford Road (SR 1108)	Brunswick County Line	5.36	2	22	100	55	10600	1800	2900	10600	K	ADQ
NC 905												
South Carolina State Line	William Long Road (SR 1172)	5.89	2	20	100	55	9800	1600	2600	10600	K	ADQ
William Long Road (SR 1172)	Reeves Ferry Road (SR 1943)	3.47	2	22	100	55	10600	2000	3200	10600	K	ADQ
Reeves Ferry Road (SR 1943)	NC 130	11.54	2	22	60	55	10600	2200	2700	10600	K	70

Highway												
Facility and Segment		EXISTING CONDITIONS						AADT		RECOMMENDATIONS		
		Distance (mi)	Cross-Section lanes	(ft)	ROW (ft)	Speed Limit (mph)	Capacity (vpd)	2005 AADT	2030 AADT	Capacity (vpd)	Cross Section	ROW (ft)
From	To											
Hallsboro Road (SR 1001)												
NC 130	NC 214	10.01	2	24	60	55	10600	1700	2800	10600	K	70
NC 214	Bladen County Line	8.41	2	22	60	55	10600	1300	2000	10600	K	70
Old Lumberton Road (SR 1002)												
US 701	Robeson County Line	11.49	2	22	60	55	10600	1800	2200	10600	K	70
Rough and Ready Road (SR 1004)												
NC 904	Fair Bluff City Limits	0.90	2	22	60	35	10600	1200	1300	10600	K	70
Fair Bluff City Limits	US 701	16.59	2	22	60	55	10600	2100	3500	10600	K	70
Peacock Road (SR 1005)												
NC 904	Chadbourn Planning Boundary	19.75	2	18	60	55	8400	1800	2100	10600	K	70
Old Dock Road (SR 1006)												
NC 130	NC 904	16.69	2	18	60	55	8400	500	700	10600	K	70
Old Tram Road (SR 1159)												
Poley Bridge Road (SR 1212)	Ford Road (SR 1157)	5.06	2	20	60	55	9800	700	1000	10600	K	70
Antioch Church Road (SR 1162)												
Ford Road (SR 1157)	Pleasant Plains Road (SR 1166)	2.52	2	18	60	55	8400	700	1000	10600	K	70
Pleasant Plains Road (SR 1166)												
NC 130	Whiteville Planning Boundary	4.18	2	18	60	55	8400	1000	1100	10600	K	70
Old Stake Road (SR 1300)												
Tabor City Planning Boundary	Emerson Church Road (SR 1310)	1.00	2	18	60	55	8400	1600	1700	10600	K	70
Ten Mile Road (SR 1308)												
Emerson Church Road (SR 1310)	Sidney Road (SR 1314)	1.70	2	18	60	55	8400	700	900	10600	K	70
Emerson Church Road (SR 1310)												
Old Stake Road (SR 1300)	Ten Mile Road (SR 1308)	0.74	2	18	60	55	8400	700	900	10600	K	70
Clarendon Road (SR 1317)												
Sidney Road (SR 1314)	Chadbourn Planning Boundary	7.01	2	18	60	55	8400	700	900	10600	K	70
Beaverdam Road (SR 1324)												
US 701	NC 410	4.17	2	18	60	55	8400	700	900	10600	K	70
Powell Street (SR 1407)												
Main Street (SR 1408)	US 76	0.42	2	20	60	35	9800	600	800	10600	K	70

Highway												
Facility and Segment		EXISTING CONDITIONS						AADT		RECOMMENDATIONS		
		Distance (mi)	Cross-Section lanes	(ft)	ROW (ft)	Speed Limit (mph)	Capacity (vpd)	2005 AADT	2030 AADT	Capacity (vpd)	Cross Section	ROW (ft)
From	To											
Main Street (SR 1408)												
Powell Street (SR 1407)	Cedar Grove Church Road (SR 1410)	0.07	2	32	60	35	10600	600	800	ADQ	ADQ	70
Cedar Grove Church Road (SR 1410)												
Main Street (SR 1408)	Cerro Gordo City Limits	0.28	2	18	60	35	8400	600	800	10600	K	70
Cerro Gordo City Limits	Rough and Ready Road (SR 1004)	3.83	2	18	60	55	8400	600	800	10600	K	70
Blackwell Road (SR 1412)												
Old Stake Road (SR 1300)	Cedar Grove Church Road (SR 1410)	4.36	2	18	60	55	8400	600	800	10600	K	70
Lewis Road (SR 1415)												
Cedar Grove Church Road (SR 1410)	Cherry Street (SR 1352)	1.13	2	18	60	55	8400	600	800	10600	K	70
Slippery Log Road (SR 1429)												
Chadbourn Planning Boundary	Whiteville Planning Boundary	1.50	2	20	60	55	9800	2600	3000	10600	K	70
Grits Road (SR 1443)												
US 76	Braswell Road (SR 1414)	0.82	2	18	60	45	8400	1600	1700	10600	K	70
Smyrna Road (SR 1552)												
Whiteville Planning Boundary	Peacock Road (SR 1005)	3.10	2	18	60	55	8400	1200	1500	10600	K	70
Klondike Road (SR 1572)												
NC 410	Peacock Road (SR 1005)	1.98	2	20	60	55	9800	800	1000	10600	K	70
Red Hill Road (SR 1700)												
Bladen County Line	Pavement Change	4.90	2	18	60	55	8400	600	800	10600	K	70
Pavement Change	Begin 48' Pavement	4.27	2	22	60	55	9800	2100	3000	10600	K	70
Begin 48' Pavement	US 74	0.35	4	52	150	55	37900	2100	3000	ADQ	ADQ	ADQ
Old Lake Road (SR 1740)												
NC 87	US 74/76	17.09	2	22	60	55	10600	1800	2200	10600	K	70
Water Tank Road (SR 1824)												
Livingston Chapel Road (SR 1843)	US 74/76	4.09	2	18	60	55	8400	500	600	10600	K	70
Livingston Chapel Road (SR 1843)												
Water Tank Road (SR 1824)	US 74/76	4.61	2	18	60	55	8400	1000	1300	10600	K	70

Rail										
					EXISTING SYSTEM			PROPOSED SYSTEM		
Facility and Segment		Class	Speed Limit	Distance	Type	ROW	Trains	Type	ROW	Trains
From	To		(mph)	(mi)		(ft)	per day		(ft)	per day
CSX Transportation SE Line		I								
Bladen County Line (to Lumberton)	Brunswick County Line (to Wilmington)		40	9.00	Freight	200	8	Freight	200	8
Carolina Souther Railroad (CALA) AC Line		III								
South Carolina State Line (to Mullins)	Whiteville		25	21.00	Freight	130	2	Freight	130	2
Carolina Southern Railroad (CALA) ACH Line		III								
South Carolina State Line (to Myrtle Beach)	Whiteville		25	18.00	Freight	130	2	Freight	130	2
Public Transportation										
Type and Segment					Type			Distance		Time
From	To							(mi)		
Columbus Connector (Shuttle that takes employees from Columbus County to Wilmington for employment opportunities)					Shuttle					
Downtown Wilmington	Columbus County Health Department							45.70		5:50 AM
Columbus County Health Department	Hallsboro BP Station							6.30		6:00 AM
Hallsboro BP Station	Lake Waccamaw Shopping Center							4.40		6:07 AM
Lake Waccamaw Shopping Center	Bolton Senior Center							6.80		6:17 AM
Bolton Senior Center	Downtown Wilmington							28.20		7:02 AM
Downtown Wilmington	Bolton Senior Center							28.20		6:35 PM
Bolton Senior Center	Lake Waccamaw Shopping Center							6.80		6:45 PM
Lake Waccamaw Shopping Center	Hallsboro BP Station							4.40		6:52 PM
Hallsboro BP Station	Columbus County Health Department							6.30		7:02 PM
Columbus County Health Department	Downtown Wilmington							45.70		8:05 PM

APPENDIX D

Typical Cross-Sections

Typical Transportation Cross Sections

Cross section requirements for roadways vary according to the capacity and level of service to be provided. Universal standards in the design of roadways are not practical. Each roadway section must be individually analyzed and its cross section determined based on the volume and type of projected traffic, existing capacity, desired level of service, and available right-of-way. These cross sections are typical for facilities on new location and where right-of-way constraints are not critical. For widening projects and urban projects with limited right-of-way, special cross sections should be developed that meet the needs of the project.

On all existing and proposed roadways delineated on the CTP, adequate right-of-way should be protected or acquired for the recommended cross sections. In addition to cross section and right-of-way recommendations for improvements, Appendix C may recommend ultimate needed right-of-way for the following situations:

- roadways which may require widening after the current planning period,
- roadways which are borderline adequate and accelerated traffic growth could render them deficient, and
- roadways where an urban curb and gutter cross section may be locally desirable because of urban development or redevelopment.

Recommended design standards relating to grades, sight distances, degree of curve, superelevation, and other considerations for roadways are given in Appendix E. The typical cross sections are described below and shown on pages D5-D11.

A: Four Lanes Divided with Median - Freeway

Cross section "A" is typical for four-lane divided highways in rural areas that may have only partial or no control of access. The minimum median width for this cross section is 46 feet, but a wider median is desirable.

B: Seven Lanes - Curb & Gutter

Cross section "B" is typically not recommended for new projects. When the conditions warrant six lanes, cross section "D" should be recommended. Cross section "B" should be used only in special situations such as when widening from a five-lane section where right-of-way is limited. Even in these situations, consideration should be given to converting the center turn lane to a median so that cross section "D" is the final cross section.

C: Five Lanes - Curb & Gutter

Typical for major thoroughfares, cross section "C" is desirable where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

D: Six Lanes Divided with Raised Median - Curb & Gutter

E: Four Lanes Divided with Raised Median - Curb and Gutter

Cross sections "D" and "E" are typically used on major thoroughfares where left turns and intersection streets are not as frequent. Left turns would be restricted to a few selected intersections. The 16-ft median is the minimum recommended for an urban boulevard-type cross section. In most instances, monolithic construction should be

utilized due to greater cost effectiveness, ease and speed of placement, and reduced future maintenance requirements. In certain cases, grass or landscaped medians result in greatly increased maintenance costs and an increase danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

F: Four Lanes Divided - Boulevard, Grass Median

Cross section "F" is typically recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 ft is recommended, with 30 ft being desirable.

G: Four Lanes - Curb and Gutter

Cross section "G" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would likely be required at major intersections. This cross section should be used only if the above criteria are met. If right-of-way is not restricted, future strip development could take place and the inner lanes could become de facto left turn lanes.

H: Three Lanes - Curb and Gutter

In urban environments, thoroughfares that are proposed to function as one-way traffic carriers would typically require cross section "H".

I: Two Lanes – Curb and Gutter, Parking both sides

J: Two Lanes – Curb and Gutter, Parking one side

Cross section "I" and "J" are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross-section "I" would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

K: Two Lanes - Paved Shoulder

Cross section "K" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time. For areas that are growing and future widening will be necessary, the full right-of-way of 100 ft should be required. In some instances, local ordinances may not allow the full 100 ft. In those cases, 70 ft should be preserved with the understanding that the full 70 ft will be preserved by use of building setbacks and future street line ordinances.

L: Six Lanes Divided with Grass Median - Freeway

Cross section "L" is typical for controlled access freeways. The 46-ft grass median is the minimum desirable width, but variation from this may be permissible depending upon design considerations. Right-of-way requirements are typically 228 ft or greater, depending upon cut and fill requirements.

M: Eight Lanes Divided with Raised Median - Curb and Gutter

Also used for controlled access freeways, cross section "M" may be recommended for freeways going through major urban areas or for routes projected to carry very high volumes of traffic.

N: Five Lanes with Curb & Gutter, Widened Curb Lanes

O: Two Lanes/Shoulder Section**P: Four Lanes Divided with Raised Median – Curb & Gutter, Widened Curb Lanes**

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The North Carolina Bicycle Facilities Planning and Design Guidelines should be consulted for design standards for bicycle facilities. Cross sections “N”, “O” and “P” are typically used to accommodate bicycle travel.

General

The urban curb and gutter cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

The right-of-way shown for each typical cross section is the minimum amount required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban roadway construction.

Bicycle Cross Sections

Cross sections B-1, B-2, B-3, B-4, and B-5 are typical bicycle cross sections. Contact the NCDOT Division of Bicycle and Pedestrian Transportation for more information regarding these cross sections.

B-1: Four Lanes Divided with Wide Outside Lanes**B-2: Five Lanes with Wide Outside Lanes**

A widened outside lane is an effective way to accommodate bicyclists riding in the same lane with motor vehicles. With a wide outside lane, motorists do not have to change lanes to pass a bicyclist. The additional width in the outside lane also improves sight distance and provides more room for vehicles to turn onto the roadway. Therefore, on roadways with bicycle traffic, widening the outside lane can improve the capacity of that roadway. Also, by widening the outside lane by a few extra feet both motorists and bicyclists have more space in which to maneuver. This facility type is generally considered for use in urban, suburban, and occasionally rural conditions on roadways where there is a curb and gutter. Wide outside lanes can be applied to several different roadway cross sections.

B-3: Bicycle Lanes on Collector Streets

Bicycle lanes may be considered when it is desirable to delineate road space for preferential use by cyclists. Streets striped with bicycle lanes should be part of a connected bikeway system rather than being an isolated feature. Bicycle lanes function most effectively in mid-block situations by separating bicyclists from overtaking motor vehicles. Integrating bicyclists into complicated intersection traffic patterns can sometimes be problematic. Strip development areas, or roadways with a high number of commercial driveways, tend to be less suitable for bicycle lanes due to frequent and unpredictable motorist turning movements across the path of straight-through cyclists. Striped bike lanes can be effective as a safety treatment, especially for less experienced bicyclists. Two-lane residential/collector streets with lower traffic volume,

low-posted speed limit, adequate roadway width for both bike lanes and motor vehicle travel lanes, and an absence of complicated intersections. A median-divided multi-lane roadway with lower traffic volumes and a low volume of right and left turning traffic would be a more appropriate location for bicycle lanes than a high traffic volume undivided multi-lane roadway with a continuous center turn lane. Most bicyclists will choose a route that combines direct access with lower traffic volumes. An origin and destination of less than 4 miles is desirable to generate usage on a facility.

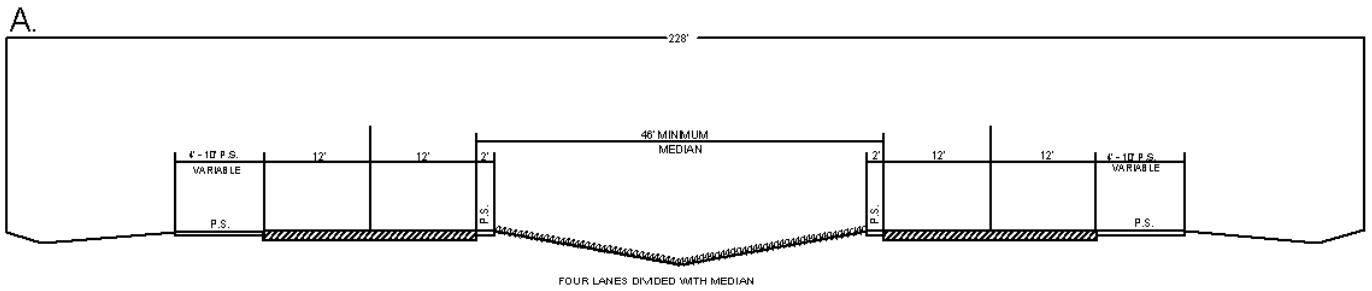
B-4: Wide Paved Shoulders

On urban streets with curb and gutter, wide outside lanes and bicycle lanes are usually the preferred facilities. Shoulders for bicycle use are not typically provided on roadways with curb and gutter. On rural roadways where bicycle travel is common, such as roads in coastal resort areas, wide paved shoulders are highly desirable. On secondary roadways without curb and gutter where there are few commercial driveways and intersections with other roadways, many bicyclists prefer riding on wide, smoothly paved shoulders.

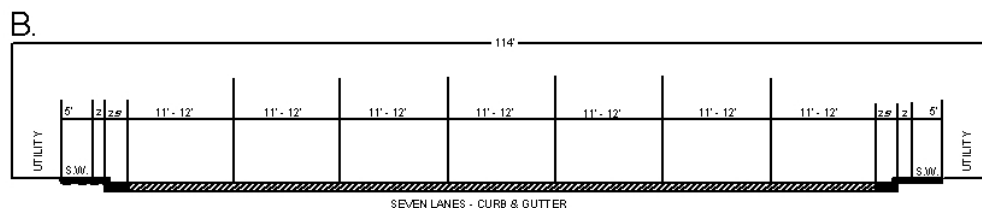
B-5: Multi-use Pathway

When properly located, multi-use pathway can be a safer type of facility for novice and child bicyclists because they do not have to share the path with motor vehicles. The design standards used for this cross section provides adequate width for two-directional use by both cyclists and pedestrians, provisions of good sight distance, avoidance of steep grades and tight curves, and minimal cross-flow by motor vehicles. A multi-use pathway can serve a variety of purposes, including recreation and transportation. This pathway should not be located immediately adjacent to a roadway because of safety considerations at intersections with driveways and roads. Sidewalks should never be used as a multi-use pathway.

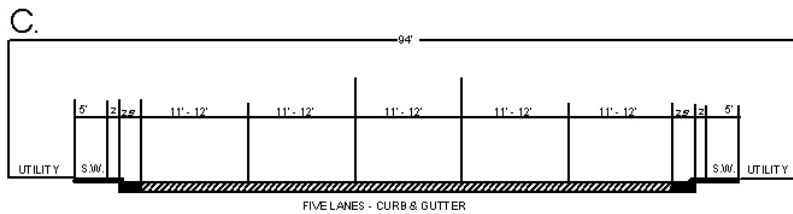
TYPICAL HIGHWAY CROSS SECTIONS



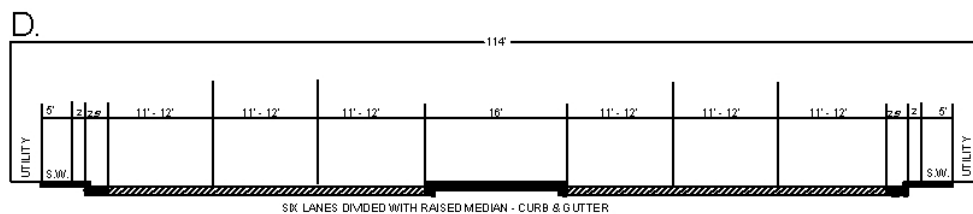
Freeway/Expressway



Other Major Thoroughfare

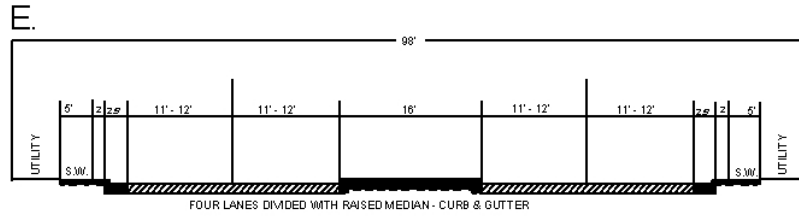


Other Major Thoroughfare

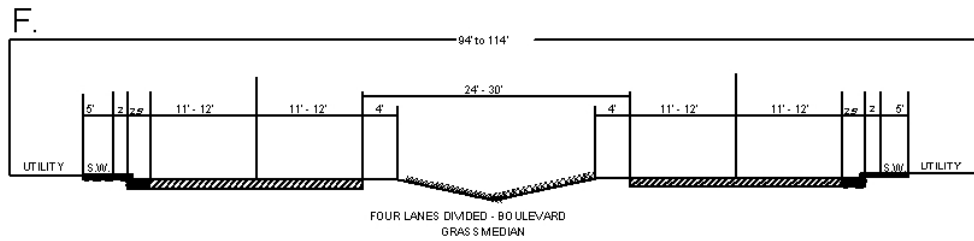


Expressway/Boulevard

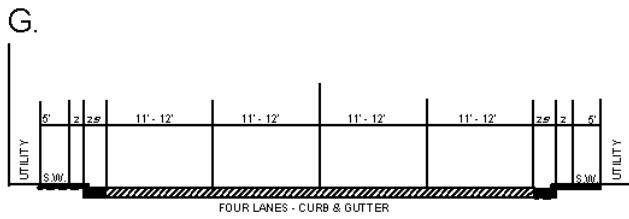
TYPICAL HIGHWAY CROSS SECTIONS



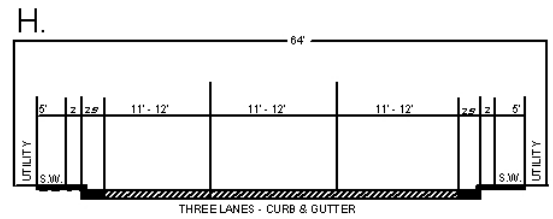
Expressway/Boulevard



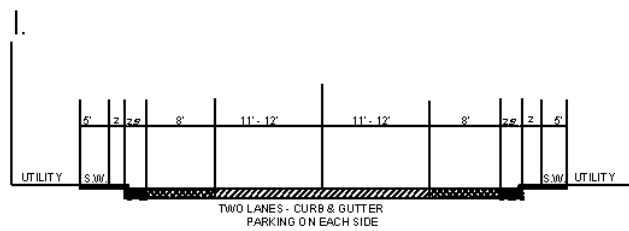
Expressway/Boulevard



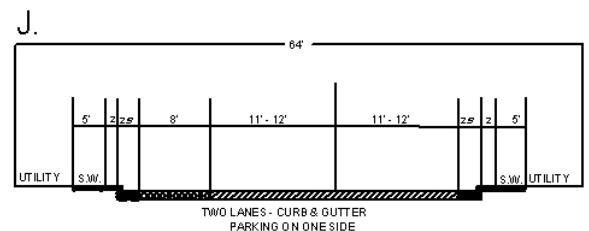
Other Major Thoroughfare



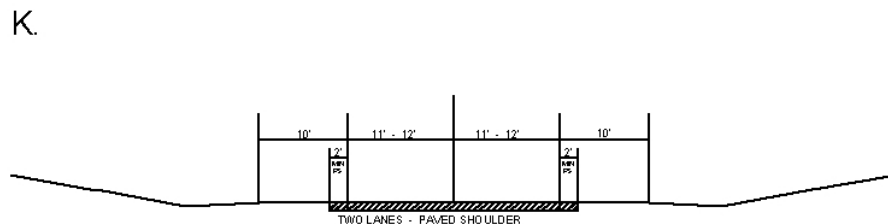
Minor Thoroughfare



Minor Thoroughfare



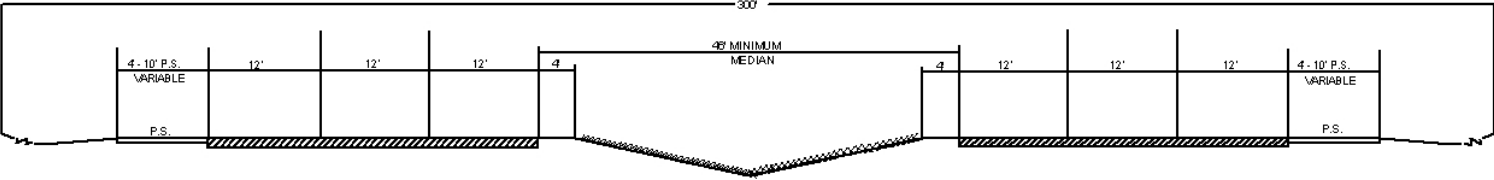
Minor Thoroughfare



Minor Thoroughfare or US/NC Routes

TYPICAL HIGHWAY CROSS SECTIONS

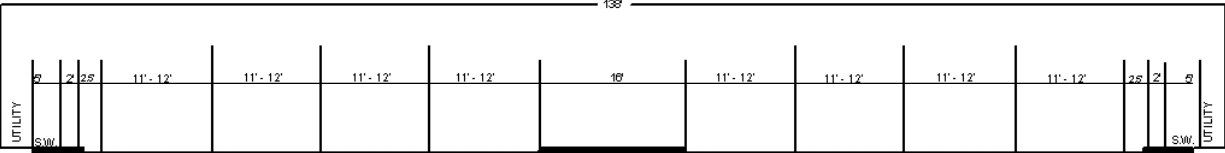
L.



SIX LANES DIVIDED WITH GRASS MEDIAN

Freeway/Expressway

M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

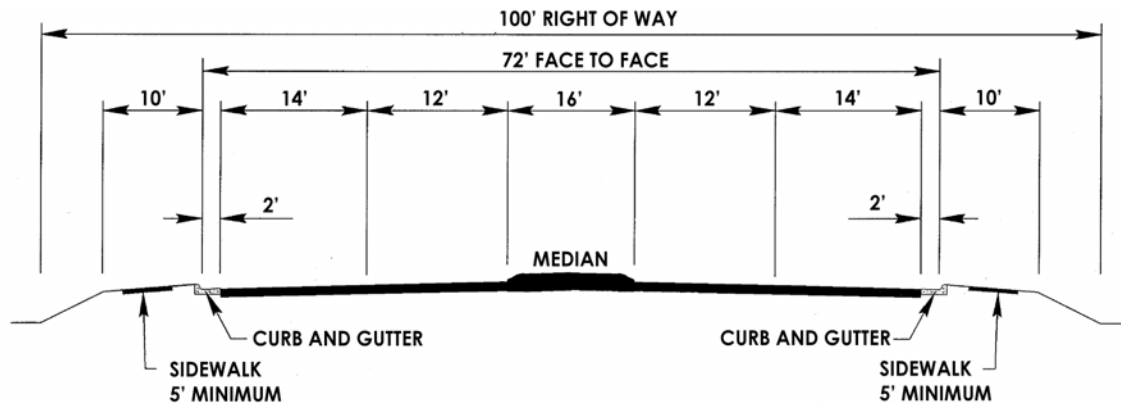
Expressway/Boulevard

Typical Bicycle Cross Sections

WIDE CURB LANES

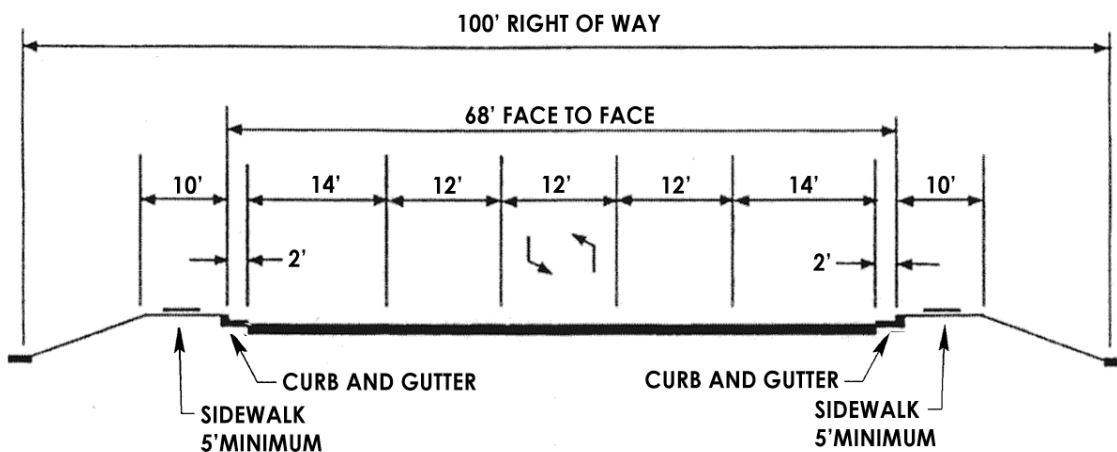
B-1 4-LANE MEDIAN DIVIDED TYPICAL SECTION

With Wide Outside Lanes



B-2 5-LANE TYPICAL SECTION

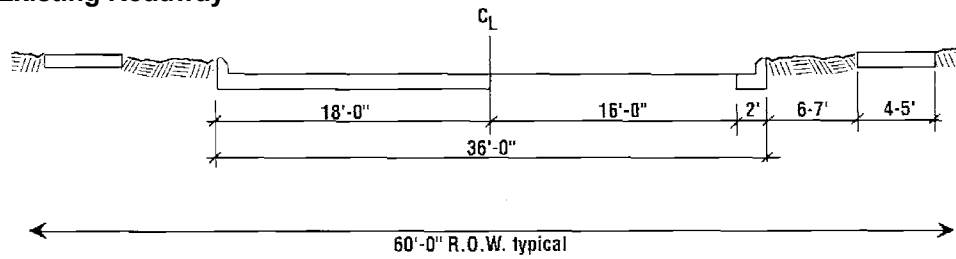
With Wide Outside Lanes



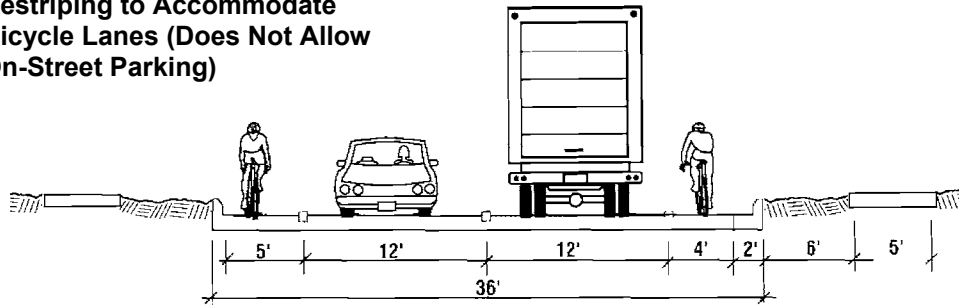
Typical Bicycle Cross Sections

B-3 BICYCLE LANES ON COLLECTOR STREETS

Existing Roadway



**Restriping to Accommodate
Bicycle Lanes (Does Not Allow
On-Street Parking)**

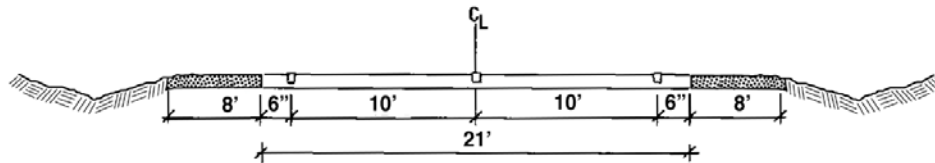


Typical Bicycle Cross Sections

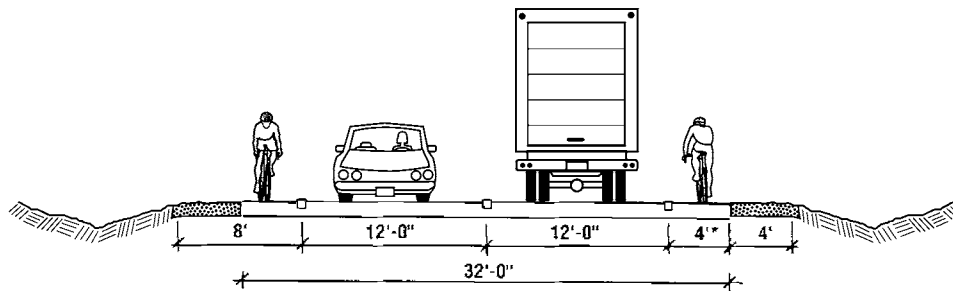
B-4

WIDE PAVED SHOULDERS

Existing Roadway



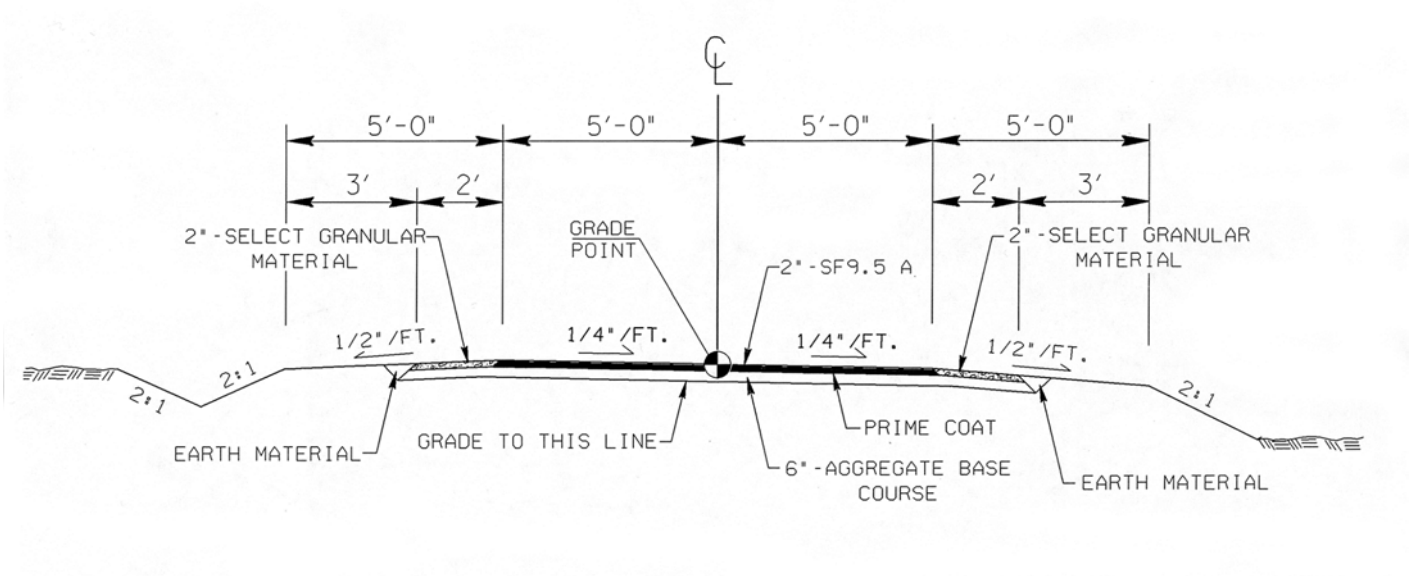
**Roadway Retrofitted with
4-Ft Paved Shoulders**



* If speeds are higher than 40 mph,
shoulder widths greater than 4' are
recommended.

Typical Bicycle Cross Sections

B-5 RECOMMENDED TYPICAL SECTION OF 10-FT ASPHALT PATHWAY With 2-Ft Select Material Shoulder



APPENDIX E

Definitions of Environmental Status Codes

Definitions Of Environmental Status Codes: Natural Heritage Program List

<u>North Carolina Status</u>	<u>Descriptions of Plants*</u>
E Endangered	“Any species or higher taxon of plant whose continued existence as a viable component of the States flora is determined to be in jeopardy” (GS 19B 106: 202.12). (Endangered species may not be removed from the wild except when a permit is obtained for research, propagation, or rescue which will enhance the survival of the species).
T Threatened	“Any resident species of plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (GS 19B 106: 202.12). (Regulations are the same as for Endangered Species).
SC Special Concern	“Any species of plant in North Carolina which requires monitoring but which may be collected and sold under regulations adopted under the provisions of [the Plant Protection and Conservation Act]” (GS 19B 106:202.12). (Special Concern species which are not also listed as Endangered or Threatened may be collected from the wild and sold under specific regulations. Propagated material only of Special Concern species which are also listed as Endangered or Threatened may be traded or sold under specific regulations.)
C Candidate	Species which are very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction (and sometimes also by direct exploitation or disease). These species are also either rare throughout their ranges (fewer than 100 populations total) or disjunct in North Carolina from a main range in a different part of the country or world. Also included are species which may have 20-50 populations in North Carolina, but fewer than 50 populations worldwide. These are species which have the preponderance of their distribution in North Carolina and whose fate depends largely on their conservation here. Also included are many species known to have once occurred in North Carolina but

* **Plant statuses** are determined by the Plant Conservation Program (NC Department of Agriculture) and the Natural Heritage Program (NC Department of Environment and Natural Resources). Endangered, Threatened, and Special Concern species are protected by state law (Plant Protection and Conservation Act, 1979). Candidate and Significantly Rare designations indicate rarity and the need for population monitoring and conservation action. Note that plants can have a double status, e.g., E-SC, indicates that while the plant is endangered, it is collected or sold under regulation.

with no known extant occurrences in the state (historical or extirpated species); if these species are relocated in the state, they are likely to be listed as Endangered or Threatened. If present land use trends continue, candidate species are likely to merit listing as Endangered or Threatened.

SR Significantly Rare

Species which are very rare in North Carolina, generally substantially reduced in numbers by habitat destruction (and sometimes also by direct exploitation or disease). These species are generally more common somewhere else in their ranges, occurring in North Carolina peripherally to their main ranges, mostly in habitats which are unusual in North Carolina. Also included are some species with 20-100 populations in North Carolina, if they also have only 50-100 populations rangewide and are declining.

-L Limited

The range of the species is limited to North Carolina and adjacent states (endemic or near endemic). These are species which may have 20-50 populations in North Carolina, but fewer than 50 populations rangewide. The preponderance of their distribution is in North Carolina and their fate depends largely on conservation here. Also included are some species with 20-100 populations in North Carolina, if they also have only 50-100 populations rangewide and declining.

-T Throughout

These species are rare throughout their ranges (fewer than 100 populations total)

-D Disjunct

The species is disjunct to NC from a main range in a different part of the country or world.

-P Peripheral

The species is at the periphery of its range in NC. These species are generally more common somewhere else in their ranges, occurring in North Carolina peripherally to their main ranges, mostly in habitats which are unusual in North Carolina.

-O Other

The range of the species is sporadic or cannot be described by the other Significantly Rare categories

P_ Proposed

A species which has been formally proposed for listing as Endangered, Threatened, or Special Concern, but has not yet completed the legally mandated listing process.

<u>North Carolina Status</u>	<u>Description of Animals²</u>
E Endangered	"Any native or once-native species of wild animal whose continued existence as a viable component of the State's fauna is determined by the Wildlife Resources Commission to be in jeopardy or any species of wild animal determined to be an 'endangered species' pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987).
T Threatened	"Any native or once-native species of wild animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a threatened species pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987).
SC Special Concern	"Any species of wild animal native or once-native to North Carolina which is determined by the Wildlife Resources Commission to require monitoring but which may be taken under regulations adopted under the provisions of this Article." (Article 25 of Chapter 113 of the General Statutes; 1987).
SR Significantly Rare	Any species which has not been listed by the N.C. Wildlife Resources Commission as an Endangered, Threatened, or Special Concern species, but which exists in the state in small numbers and has been determined by the N.C. Natural Heritage Program to need monitoring. (This is a N.C. Natural Heritage Program designation.) Significantly Rare species include "peripheral" species, whereby North Carolina lies at the periphery of the species' range (such as Hermit Thrush). The designation also includes marine and estuarine fishes identified as "Vulnerable" by the N.C. State Museum of Biological Sciences (Ross et al., 1988, <u>Endangered, Threatened, and Rare Fauna of North Carolina. Part II. A Reevaluation of the Marine and Estuarine Fishes</u>).
EX Extirpated	A species which is no longer believed to occur in the state.
P_ Proposed	Species has been proposed by a Scientific Council as a status (Endangered, Threatened, Special Concern, Watch

² Animal statuses are determined by the Wildlife Resources Commission and the Natural Heritage Program. Endangered, Threatened, and Special Concern species of mammals, birds, reptiles, amphibians, freshwater fishes, and freshwater and terrestrial mollusks have legal protection status in North Carolina (Wildlife Resources Commission). The Significantly Rare designation indicates rarity and the need for population monitoring and conservation action.

List, or for De-listing) that is different from the current status, but the status has not yet been adopted by the Wildlife Resources Commission and by the General Assembly as law. In the lists of rare species in this book, these proposed statuses are listed in parentheses below the current status. Only those proposed statuses that are different from the current statuses are listed.

<u>Federal Status</u>	<u>Description</u> ³
E Endangered	A taxon “which is in danger of extinction throughout all or a significant portion of its range” (Endangered Species Act, Section 3).
T Threatened	A taxon “which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (Endangered Species Act, Section 3).
EXN Endangered, nonessential experimental population.	The Endangered Species Act permits the reintroduction of endangered animals as "nonessential experimental" populations. Such populations, considered nonessential to the survival of the species, are managed with fewer restrictions than populations listed as endangered.
T Threatened (S/A) due to Similarity of Appearance.	The Endangered Species Act authorizes the treatment of a species (subspecies or population segment) as threatened even though it is not otherwise listed as threatened if: (a) The species so closely resembles in appearance a threatened species that enforcement personnel would have substantial difficulty in differentiating between the listed and unlisted species; (b) the effect of this substantial difficulty is an additional threat to a threatened species; and (c) such treatment of an unlisted species will substantially facilitate the enforcement and further the policy of the Act. The American Alligator has this designation due to similarity of appearance to other rare crocodilians. The Bog Turtle (southern population) has this designation due to similarity of appearance to Bog Turtles in the threatened northern population.
C Candidate	A taxon under consideration for which there is sufficient information to support listing. This category was formerly designated as a Candidate 1 (C1) species.

³ These statuses are designated by the US Fish and Wildlife Service. Federally listed Endangered and Threatened species are protected under the provisions of the Endangered Species Act of 1973, as amended through the 100th Congress. Unless otherwise noted, definitions are taken from the *Federal Register*, Vol. 56, No. 225, November 21, 1991 (50 CFR Part 17).

FSC	Federal “Species of Concern”	Formerly defined as a taxon under consideration for which there is insufficient information to support listing; formerly designated as a Candidate 2 (C2) species.
PE	Proposed Endangered	Species has been proposed for listing as endangered.
PD	Proposed De- listed	Species has been proposed for de-listing.

State Ranks

Description

S1	Critically imperiled in North Carolina because of extreme rarity or otherwise very vulnerable to extirpation in the state.
S2	Imperiled in North Carolina because of rarity or otherwise vulnerable to extirpation in the state.
S3	Rare or uncommon in North Carolina
S4	Apparently secure in North Carolina, with many occurrences.
S5	Demonstrably secure in North Carolina and essentially ineradicable under present conditions.
SA	Accidental or casual; one to several records for North Carolina, but the state is outside the normal range of the species.
SH	Of historical occurrence in North Carolina, perhaps not having been verified in the past 25 years, and suspected to be still extant in the state.
SR	Reported from North Carolina, but without persuasive documentation for either accepting or rejecting the report.
SX	Believed to be extirpated from North Carolina.
SU	Possibly in peril in North Carolina, but status uncertain; more information is needed.
S?	Unranked, or rank uncertain.
S_B	Rank of breeding population in the state. Used for migratory species only.
S_N	Rank of non-breeding population in the state. Used for migratory species only.

SZ_

Population is not of significant conservation concern;
applies to transitory, migratory species.

APPENDIX

Recommended Subdivision Ordinances

Definitions

Rural Roads

- *Principal Arterial* - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.
- *Minor Arterial* - A rural roadway joining cities and larger towns and providing intra-state and inter-county service at relatively high overall travel speeds with minimum interference to through movement.
- *Major Collector* - A road that serves major intra-county travel corridors and traffic generators and provides access to the arterial system.
- *Minor Collector* - A road that provides service to small local communities and traffic generators and provides access to the major collector system.
- *Local Road* - A road that serves primarily to provide access to adjacent land over relatively short distances.

Urban Streets

- *Major Thoroughfares* - Major thoroughfares consist of inter-state, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.
- *Minor Thoroughfares* - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through traffic movements and may also serve abutting property.
- *Local Street* - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

Specific Type Rural or Urban Streets

- *Freeway, expressway, or parkway* - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A *freeway* provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of interchanges. An *expressway* is a facility with full or partial control of access and generally with grade separations at major intersections. A *parkway* is for non-commercial traffic, with full or partial control of access.
- *Residential Collector Street* - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

- *Local Residential Street* - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than 1.0 mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.
- *Cul-de-sac* - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.
- *Frontage Road* - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.
- *Alley* - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

Property

- *Building Setback Line* - A line parallel to the street in front of which no structure shall be erected.
- *Easement* - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.
- *Lot* - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

Subdivision

- *Subdivider* - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.
- *Subdivision* - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets. The following shall not be included within this definition nor subject to these regulations:
 - the combination or re-combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein
 - the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved
 - the public acquisition, by purchase, of strips of land for the widening or the opening of streets
 - the division of a tract in single ownership whose entire area is no greater than 2 acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

- *Dedication* - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.
- *Reservation* - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

Design Standards

The design of all roads within the Planning Area shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway and Transportation Officials (AASHTO) manual.

The provision of street rights-of-way shall conform and meet the recommendations of the transportation plan, as adopted by the municipality. The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

Right-of-way Widths

Right-of-way widths shall not be less than the following and shall apply except in those cases where right-of-way requirements have been specifically set out in the transportation plan.

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. On all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width right-of-way, not less than 60 feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is sub-divided, the remainder of the full-required right-of-way shall be dedicated. Minimum right-of-way requirements are shown in Table F-1.

Table F-1

Minimum Right-of-way Requirements		
Area Classification	Functional Classification	Minimum ROW
Rural	Principal Arterial (Freeway)	350 feet
	Principal Arterial (Other)	200 feet
	Minor Arterial	100 feet
	Major Collector	100 feet
	Minor Collector	80 feet
	Local Road (see note #1)	60 feet
Urban	Major Thoroughfare	90 feet
	Minor Thoroughfare	70 feet
	Local Street	60 feet
	Cul-de-sac (See note #2)	varies
<p>1) The desirable minimum right-of-ways is 60 feet. If curb and gutter is provided, 50 feet of ROW is adequate on local residential streets.</p>		
<p>2) The ROW dimension will depend on the radius used for vehicle turn-a-around. Distance from edge of pavement of turn-a-around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn-a-round.</p>		

Street Widths

Widths for street and road classifications other than local shall be as recommended by the transportation plan. Width of local roads and streets shall be as follows:

- *Local Residential*
 - Curb and Gutter section - 26 feet, face to face curb
 - Shoulder section - 20 feet to edge of pavement, 4 feet for shoulders
- *Residential Collector*
 - Curb and Gutter section - 34 feet, face to face of curb
 - Shoulder section - 20 feet to edge of pavement, 6 feet for shoulders

Geometric Characteristics

The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the

requirements of dedication and reservation discussed under right-of-way shall apply.

- *Design Speed* - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for subdivision type streets are shown in Table F-2.
- *Minimum Sight Distance* - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the parameters set forth in Table F-3.
- *Superelevation* - Table F-4 shows the minimum radius and the related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.
- *Maximum and Minimum Grades* - The maximum grades in percent are shown in Table F-5. Minimum grade should not be less than 0.5%. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.

Table F-2

Design Speeds			
Facility Type	Desirable	Design Speed (mph)	
		Minimum Level	Rolling
<i>Rural</i>			
Minor Collector Roads (AADT Over 2000)	60	50	40
Local Roads ¹ (AADT Over 400)	50	*50	*40
<i>Urban</i>			
Major Thoroughfares ²	60	50	40
Minor Thoroughfares	40	30	30
Local Streets	30	**30	**20

*Based on AADT of 400-750. Where roads serve limited area and small number of units, reduce minimum design speed. **Based on projected ADT of 50-250. (Refer to NCDOT Roadway Design Manual page 1-1B)

¹ Local Roads including Residential Collectors and Local Residential.

² Major Thoroughfares other than Freeways or Expressways.

Table F-3

Sight Distance					
Design Speed Distance (mph)	Stopping Sight Distance (feet)		Minimum K ¹ Values (feet)		Passing Sight Distance (feet)
lanes	Desirable	Minimum	Crest Curve	Sag Curve	For 2-
30	200	200	30	40	1100
40	325	275	60	60	1500
50	475	400	110	90	1800
60	650	525	190	120	2100

Note: General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case. (Reference NCDOT Roadway Design Manual page 1-12 T-1)

¹K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length of the vertical curve, which will provide the desired sight distance. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1990".

Table F-4

Superelevation						
Design Speed Curve (mph)	Minimum Radius of Maximum e ¹			Maximum Degree of		
e=0.08	e=0.04	e=0.06	e=0.08	e=0.04	e=0.06	
30	302	273	260	19 00'	21 00'	22 45'
60	573	521	477	10 00'	11 15'	12 15'
80	955	955	819	6 00'	6 45'	7 30'
100	1,637	1,432	1,146	3 45'	4 15'	4 45'

¹ e = rate of roadway superelevation, foot per foot

Note: (Reference NCDOT Roadway Design Manual page 1-12 T-6 thru T-8)

Table F-5

Maximum Vertical Grade				
Facility Type and Design Speed (mph)	Mountainous	Minimum Grade in Percent		
		Flat	Rolling	
RURAL				
Minor Collector Roads*				
	20	7	10	12
	30	7	9	10
	40	7	8	10
	50	6	7	9
	60	5	6	8
	70	4	5	6
Local Roads* ¹				
	20	-	11	16
	30	7	10	14
	40	7	9	12
	50	6	8	10
	60	5	6	-
URBAN				
Major Thoroughfares ²				
	30	8	9	11
	40	7	8	10
	50	6	7	9
	60	5	6	8
Minor Thoroughfares*				
	20	9	12	14
	30	9	11	12
	40	9	10	12
	50	7	8	10
	60	6	7	9
	70	5	6	7
Local Streets*				
	20	-	11	16
	30	7	10	14
	40	7	9	12
	50	6	8	10
	60	5	6	-

Note: *For streets and roads with projected annual average daily traffic less than 250 or short grades less than 500 ft long, grades may be 2% steeper than the values in the above table. (Reference NCDOT Roadway Metric Design Manual page 1-12 T-3)

¹ Local Roads including Residential Collectors and Local Residential.

² Major Thoroughfares other than Freeways or Expressways.

Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.
2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.
3. Offset intersections are to be avoided. A minimum length of 200 feet should separate intersections that cannot be aligned between survey centerlines.

Cul-de-sacs

Cul-de-sacs shall not be more than 500 feet in length. The distance from the edge of pavement on the vehicular turn around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provisions are made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.
2. The width of an alley shall be at least 20 feet.
3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn around as may be required by the planning board.

Permits for Connection to State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Horizontal Width on Bridge Deck

The clear roadway widths for new and reconstructed bridges serving two-lane, two-way traffic should be as follows:

- shoulder section approach:
 - * under 800 ADT design year - minimum 28 feet width face to face of parapets, rails, or pavement width plus 10 feet, whichever is greater,
 - * 800 - 2000 ADT design year - minimum 34 feet width face to face of parapets, rails, or pavement width plus 12 feet, whichever is greater,
 - * over 2000 ADT design year - minimum width of 40 feet, desirable width of 44 feet width face to face of parapets or rails;
- curb and gutter approach:
 - * under 800 ADT design year - minimum 24 feet face to face of curbs,
 - * over 800 ADT design year - width of approach pavement measured face to face of curbs,
 - * where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face curbs, and in crown drop; the distance from face of curb to face of parapet or rail shall be a minimum of 1.5 feet, or greater if sidewalks are required.

The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

- shoulder section approach - width of approach pavement plus width of usable shoulders on the approach left and right. (shoulder width 8 feet minimum, 10 feet desirable)
- curb and gutter approach - width of approach pavement measured face to face of curbs.

APPENDIX G

Transportation
Improvement
Program
Project
Process

The process for requesting projects to be included in the Transportation Improvement Program (TIP) is described briefly in this appendix.

The local representatives should first decide which projects from the CTP they would like funded in the TIP. A TIP request for a few carefully selected projects is likely to be more effective than requesting all the projects proposed in the CTP. These projects should be prioritized by the local representatives and summarized briefly, as shown on Appendix Page G-3.

The Rural Planning Organization (RPO) is vital in selecting projects as well. The RPO is an organization that is comprised of local staff and elected officials of rural areas across the region. One of their primary duties is to conduct needs assessment for the region and develop a TIP priority list that houses the necessary projects for the area. The RPO will then submit this priority list to the Board of Transportation.

After determining which projects are the highest priority for the area, a TIP project request should be sent to the Board of Transportation Member from the municipality's or county's respective district. The TIP project request should include a letter with a prioritized summary of requested projects, as well as a TIP candidate project request form and a project location map for each project. An example of each of these items is included in this appendix.

Example

* *Note: This is not an official request submitted to the Board of Transportation. This is intended to be an example of a Transportation Improvement Program (TIP) Request.*

Month ##, Year

North Carolina Board Member
N. C. Board of Transportation
N. C. Department of Transportation
1501 MSC
Raleigh, NC 27611-5201

Dear Board Member:

SUBJECT: 20##-20## TIP Project Requests for *Generic Town*

Enclosed find the projects requested by *Generic Town* for consideration in the next TIP update. The list is presented by priority, as approved by the *Generic Town* Council at their *Month* meeting.

Generic Town also endorsed the existing schedule of projects contained in the current TIP for the city, with one request. The City requests that TIP Project R-XXXX remain as a high priority and kept on the existing schedule.

We thank you for the opportunity to participate in development of the State TIP. Please contact us immediately if additional information is needed concerning any of the enclosed project requests.

Sincerely,

John Q. Public

cc: Division Engineer
Enclosure

**Generic Town
Town Council
2008 Proposed Highway Projects (Final)**

- 1) SR 1111 (Town Street) & SR 1112 (Industry Drive) TIP Project R-XXXX
 - From SR 1113 (Country Road) to NC 11
 - Widen roadway to a multilane facility, with some new location
- 2) US 11
 - From SR 1112 (Industry Drive) to SR 1113 (Country Road)
 - Widen roadway to a multilane facility
- 3) NC 11
 - From SR 1114 (Any Road) to the existing four lane section just south of I-85
 - Widen roadway to a multilane facility
- 4) US 11 Business (Business Road)
 - From SR 1115 (Some Road) to NC 12
 - Widen facility to a five lane cross section
- 5) New Connector
 - From US 11 to US 112 Business (City Street)
 - New Facility

**Highway Program
TIP Candidate Project Request**

(Please Provide Information if Available)

Date ###/###/###

Priority No. #

County Generic

City/Town _____

Requesting Agency Generic Town Council NCTIP No. R##### (if available)

Route (US, NC, SR/Local Name) SR 1112 (Industry Drive)

Project Location (From/To/Length) From SR 1113 (Country Road) to NC 11,

Type of Project (Widening, New Facility, Bridge Replacement, Signing,
Safety, Rail Crossing, Bicycle, Enhancement, etc.)

Widen roadway to a multi-lane facility, with some new location.

Existing Cross Section 24 Feet, Type _____

Existing Row 60 to 80 Feet Existing ADT 8,000
(2006) _____

Estimated Cost, ROW \$ 900,000 Construction \$ 4,000,000

Brief Justification for Project As a major thoroughfare, this facility carries increasing traffic volumes between the industrial sites along this route to NC 11 and the I-85 corridor. In the adopted thoroughfare plan for Generic Town, it is recommended that this facility should be widened to a multi-lane cross section due to the increasing volume and the potential for more development in this area. The Town requests that this project continue to be funded.

Project Supported By (Agency/Group) _____

Other Information/ Justification

☒ Part of Comprehensive Transportation Plan

☐ Obsolete Facility

☐ Serves School

☐ High Accident (#

_____)

☐ Serves Hospital

☐ Other _____

☐ Serves Park

(Please Attach Map Showing Project Location)

APPENDIX H

Existing Transportation Plan Maps